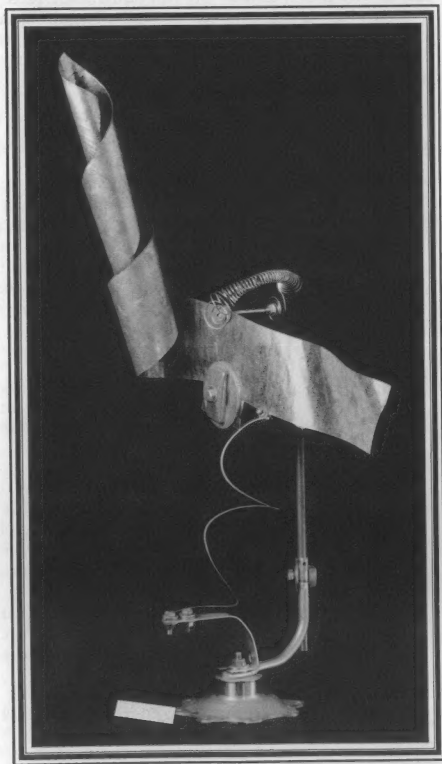


EXPERIMENTAL MUSICAL INSTRUMENTS

For the
Design,
Construction,
and
Enjoyment
of Unusual
Sound
Sources



Above: *Atlas*, by Fred "Spaceman" Long. See the article starting on page 19.
Photo by Aengus McGiffin

WHERE? AND HOW LARGE?

In making woodwind instruments, tonehole placement and sizing is a real stickler of a question. It would be great for experimental woodwind makers if they could use something like a *movable* tonehole — one that the maker or player could position and reposition at will to achieve the desired tunings. It's an impossible idea, of course. But there are ways to achieve a similar flexibility. Some are discussed in this issue of *Experimental Musical Instruments*, and you can subject them to your critical scrutiny if you turn to the article starting on page 41.

Also in this issue we continue our report on marketing, as two experienced makers and retailers take up the question, "Is it possible to make a decent return in designing and selling unconventional musical instruments?" Further, we have an article on the German-American sound artist Trimpin, maker of computer-controlled, electro-mechanically activated acoustic sound installations — environments of exquisitely timed, spatially dispersed sound events. An article on Eric Leonardson's spring-string instruments appears, as well as one on the electroacoustic scrap metal constructions of Fred "Spaceman" Long (see the photo on this page). Following that, we explore a forgotten world of 19th-century mechanical devices for studying and demonstrating acoustic phenomena.

All this and much more you will find in this issue of *Experimental Musical Instruments*. Thanks for joining us. Open, and read.

I'M HOPING that you — or possibly one of your readers — can solve a riddle for me. Photographer John Phillips took the enclosed photo [see below] of London street musicians — decorated war veterans — in 1936. You'll see that two of the men are playing what appears to be wood monochords with bell attachments.

I'm wondering if you or your readers might be able to provide more information on the instruments.

The photo is printed in *It Happened in our Lifetime: A Memoir in Words and Pictures* by John Phillips (Little, Brown 1985), page 14. It has also been published as a postcard by Fotofolio.

Thanks much for your consideration — and for *Experimental Musical Instruments*.

Peter Esmonde

1545 18th St, NW #921, Washington, DC 20036-1345
pesmonde@discovery.com



March 1996]. Ian O'Hare, Executive Director of Natural Symphonies, has confirmed that Rolf Harris had nothing to do with the CD *Two Stories in One* by the band Reconciliation. At the time of recording, Reconciliation had two didjeridu players, Alan Dargin and Philip Conyngham.

The termites that eat the core out of the eucalyptus are something called white ants by uneducated people.

The official spelling sanctioned by the Australian Institute of Aboriginal and Torres Strait Islander Studies is didjeridu. Didjeridu is almost exclusively used by music journals.

Dr. Guy Grant

President, Australian Didjeridu Association

E-mail: guygrant@tassie.net.au

FOR AOL FOLKS — I have set up a folder on Craig Anderton's Sound, Studio & Stage, Keyword: sss, in Voice of the People, User-Created Board, entitled: *Unusual Instruments*. There is as of this writing, only one notice in it — mine. Please join me and post anything fleeting and interesting about instruments, recordings, concerts, etc. for all us eccentrics! Save the good, pithy, and long-term stuff for *EMI*.

Bob Grawi

Ch. Monfort

THERE ARE INACCURACIES in Steve Wilson's article "The Didgeridoo" [in *Experimental Musical Instruments* Vol. 11 #3,

I'M LOOKING FOR an Asian stringed instrument that I hear is common in northern China and inner Asia. The Tuvans call it an *Igil*. It's rather short, about 30 inches, is fretless and has three strings tied together at the top. It is played with a bow, which I think is stored in the handle, and has a drum-like resonator about 4 inches in diameter and 10 inches long. Any clues would be helpful.

Thanks in advance.

Lincoln Stoller

P.O. Box 339, Shokan, NY 12481

matrix@mhv.net; cis:76662,2357

I WAS WONDERING if there was anybody who could help me figure out how to measure the resistance of a ribbon strip. I'm building a simple synth (my first project) and this aspect of it is a bit of a stumper for me. Anyway, if anybody there has any knowledge of this sort of thing (and has a moment to spare) I'd love to hear about it. Thank you so much.

Noah Simon

E-mail: nsimon@PO-Box.McGuill.ca



London street musicians, 1936, in a photo by John Phillips from his book *It Happened in our Lifetime: A Memoir in Words and Pictures* (Little, Brown 1985). Can anyone identify the peculiar bowed string instruments with horns?

I REALLY ENJOYED your article about Jamaican instrument maker Rupert Lewis [Experimental Musical Instruments Volume IX #1, Sept 1993]. I was not too surprised to learn the Marimbula, which I first learned about in the context of Cuban folkloric music, occurred in other Spanish colonies in the new world, but was a little surprised it has a very similar variant occurring in Jamaica in the form of the Rumba box. In your article, Mr. Lewis said he uses drive springs from old grandfather clocks & gramophones for the keys. I recently had the opportunity to speak with the great Cuban percussionist Walfredo Reyes Sr. about the Marimbula, and he said the early Cuban instruments were also made with old clock springs. With the "Rumba" being one of Cuba's most widespread and enduring musical forms, I can't help but wonder if the Jamaican Rumba box (as well as those of Puerto Rico and Haiti) were descended from a Cuban prototype which later spread throughout the Caribbean. The possibility mentioned in Richard Graham's article that the giant lamellaphones may well have been a Caribbean innovation which was later introduced to West Africa via maritime trade was also quite intriguing. Anyway, I'm very much looking forward to building my own Rumba box, and it was neat to learn more about its history.

Steve Smith

HULLO — I thought you might be amused by this excerpt from my dreams this morning.

Ranjit Bhatnagar

...The documentary continued, moving on to the influence of Arabic music on American Klezmer in the 20s and 30s. I leaned over to turn up the volume, since I've always been energized by Klezmer music. I was not disappointed. I barely noticed the grainy black-and-white photos and jumpy newsreel footage — until they showed an astonishing mutant musical instrument. A very old man, one of the last surviving experts in the Clarinet-Fiddle, was demonstrating its use. The single string was bridged along the length of the clarinet, so that one could finger the string and the clarinet at the same time, while blowing and bowing simultaneously. In another variant, the bow itself was attached to a telescoping arm, so that as you bowed, you automatically pumped the Uilleann-style bellows; and this instrument was fitted with piano-style keys that stopped both the string and the wind holes. I was astonished that such things had ever been commercially manufactured, and that I'd never heard of them. I knew I had to force myself to wake up so I could write to Bart Hopkin about these things. I started typing a letter on the computer, keeping one eye on the TV in case I could catch the credits, and I realized that I could e-mail the letter both to Bart and to Jesse: the first, fascinated by obscure instruments, and the second, interested in dreams.

The phone rang and I woke up. It was a telemarketer — I quietly put the phone down off hook and came into the other room to write this. And, you know, that phone is still off hook!

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EXPERIMENTAL MUSICAL INSTRUMENTS

For the Design, Construction and Enjoyment of Unusual Musical Sound Makers

ISSN 0863-0754

Printed in the United States

EDITOR: Bart Hopkin

ASSISTANT EDITOR/OFFICE MANAGER: Kim Johnson

PROOFREADER: Janet Hopkin

EDITORIAL BOARD: Donald Hall, Roger Hoffmann, Jon Scoville, Robin Goodfellow

Published in March, June, September and December by Experimental Musical Instruments, P.O. Box 784, Nicasio, CA 94946. Phone / fax (415) 662-2182. E-mail ExplMusInst@aol.com.

Subscriptions US\$24/year (\$27 in Mexico and Canada; \$34 overseas). Back issues & cassettes available; write for prices or see ads in this issue.

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SUBMISSIONS: Experimental Musical Instruments welcomes submissions of articles relating to new or unusual musical instruments. A query letter or phone call is suggested before sending articles.

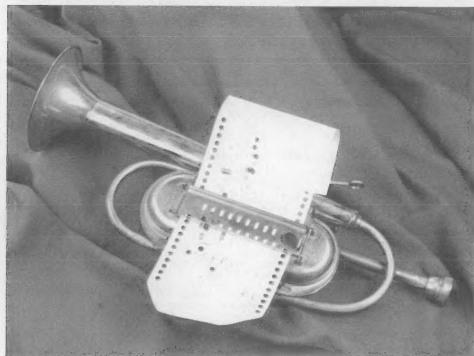
SEVERAL PEOPLE HAD SAID TO ME, "You gotta see Stomp." One of these people, *EMI* reader and behind-the-scenes idea-person Barbara Robben, finally took matters in hand and arranged for tickets for me. So I saw Stomp, and with great seats. It was terrific, and right up *EMI*'s alley, so here's a short report.

Stomp is the name of a live show and also, it seems, the name of the group that performs the show. The group started in England under the leadership of Luke Cresswell and Steve McNicholas. They gathered a troupe of dancer/percussionists, developed the show and began performing it in England and abroad in 1991, to great acclaim. More recently Stomp has spawned an American troupe, allowing performances to continue on both sides of the Atlantic.

The show consists of a series of highly choreographed percussion dances. The performers move about a stage strategically provided with noise-making props. Most of the noise makers are commonplace objects like brooms (swoosh swoosh, scrape scrape, bang bang) and plastic bags (crackle crackle) ... and many more, each somehow both obvious and unexpected. The audience quickly grasps the idea — there's sound and rhythm in everything — but it turns out to be an idea with a lot of depth: with a zillion unexpected permutations, it never gets old. The show also incorporates lots of visual humor, with not a word spoken. The performers are virtuosi, both in dance and percussion (if nothing else, you've got to be *strong* to do some of those things). The show is a worthy culmination of particular way of thinking about sound, but not at all burdened with aesthetic or intellectual pretent.

— BH

AND ANOTHER THANKS to Barbara Robben (see above) for passing on some materials from Siegfried's Mechanisches Musikabinett, a German museum of automatic musical instruments housed in a 15th century building in Rüdeshheim am Rhein



"Trompete mit Lochstreifen um 1900" from a postcard for Siegfried's Mechanisches Musikabinett, mechanical instruments museum in Rüdeshheim am Rhein, Germany.

(Oberstrasse 29, 65385 Rüdeshheim am Rhein). The collection is the work of Siegfried Wendel, who opened the museum in 1969. Among the tiny music boxes and giant orchestrions, one might also find what appears to be a trumpet with valves controlled by a perforated paper roll. The picture shown here is borrowed from a postcard from the museum, containing no further description of the instrument.

THE LAST SOUNDSCAPE NEWSLETTER: World Forum for Acoustic Ecology has ceased publication of its *Soundscape Newsletter*, after five years. WFAE will continue as an active organization promoting projects relating to environmental sound awareness. See their site on the World Wide Web at <http://interact.uoregon.edu/MediaLit/WFAEHomePage>. Affiliated organizations will continue as well, including the Japan Soundscape Association and the Swiss Soundscape Forum. In addition, there is the bimonthly journal of acoustic ecology *Soundsnipe*, available from editor Dr. Virinder Singh, B-1/297, Janak Puri, New Delhi 110 058, India.

METAL EARTH WOOD STYROFOAM = MUSIC, an exhibit of innovative musical instruments at the New York Public Library for the Performing Arts, will be just finishing up its run by the time this issue appears. If you can get to the Vincent Astor Gallery of the New York Public Library of the Performing Arts (40 Lincoln Center Plaza) before May 4th, you'll see it. If you can't, perhaps you can get a copy of the catalog, which contains thoughtful statements of a page or two from each of the artists. The artists are: Skip La Plante, maker of instruments from recycled materials and a composer of more serious bent than his penchant for cast-offs might suggest; Raphael Mostel, who cultivates the sound of singing bowls; and Ragnar Naess, maker of a set of extraordinarily beautiful ceramic instruments commissioned by composer Tan Dun. Also on view are two of the original Harry Partch instruments: quadrangularis reversum and eucal blossom.

NEW STUFF IN THE WORKS FROM *EMI*!

After years and years and years of work, *EMI*'s editor Bart Hopkin has finally completed his book *Musical Instrument Design: Information for Instrument Making*. It's now in the hands of the publisher, See Sharp Press, and we expect to have it available for purchase as of July 1, 1996. It's a large-format book of just under 200 very full, generously illustrated pages, and the cost will be \$18.95. This new book is more technically oriented than Bart's earlier book, *Making Simple Musical Instruments* (which is also available through *EMI*). It provides an overview of design principles for acoustic instruments, covering familiar sound-making systems as well as unusual and exotic ones. It takes a practical, hands-on approach, so that readers can apply the information in constructing instruments of their own design. Along the way, there are instructions for making many particularly interesting sample instruments. Several appendices provide easy reference for important information. The tone is accessible and friendly, without sacrificing seriousness of purpose. You'll be able to order *Musical Instrument Design* through *EMI*, and anyone who wishes to order an advance copy now can do so. See this issue's Notices column for details.

AND! We have another exciting project in the works as well.

The *EMI Wall Chart* is a big 24" x 36" wall poster, full from top to bottom with reference information for makers and lovers of musical instruments. Included on the poster are charts showing frequency, pitch name and wavelength relationships, just and tempered scales, the Sachs-Hornbostel musical instrument categorization system, standard music wire gauges, the overtone series, scale factors for a range of equal temperaments, overtone relationships for various vibrating systems (free bars, rods fixed at one end, cylindrical and conical air columns, etc.), an array of useful formulas and values, and so forth, and so on. All this has been rendered in a manner both readable and beguilingly attractive by graphic artist Gwendolyn Jones. In fact, even if you don't foresee having use for all that information, you'll still want the *EMI Wall Chart*, because it's a beautiful thing to see, and it's a completely unique undertaking. We expect to have it available, like the book just mentioned, around the start of July; and the cost will probably be \$12. See the Notices column for details.

DISPLAY ADS IN *EMI* are more affordable than you might think. If you have a product or service that you'd like to promote just a bit more conspicuously, contact us for details: *EMI* PO Box 784, Nicasio, CA 94946; 415/662-2182.

DO YOU HAVE A SITE ON THE WORLD WIDE WEB that *EMI* readers should know about? *EMI* has been doing a rather poor job, both in these pages and on our own web site, of keeping track of web site addresses of interest and sharing them with readers. We're hoping to do a better job in the future. If your web site is of potential interest to *EMI* readers, please let us know the address. Meanwhile, here are a few sites that people have brought to our attention recently:

Burnt Earth (ceramic instruments by Barry Hall):
<http://www.ninestones.com/burntearth.shtml>

Dan Senn (sound artist; creator of the Scrapercussion sound sculpture series): <http://www.nwrain.net/~newsense/>

David Shucavage (diverse materials relating to musical instruments, among other things): <http://www.lm.com/~dshu/folkstuff.html>

Electronic Music Foundation: <http://www.emf.org>

Experimental Musical Instruments: <http://www.thecombine.com/emi/>

Glenn Engstrand (EMI contributor; explorer of both acoustic and electronic music technology; improviser):
<http://www.vividindex.com/improv.htm>

Just Intonation Network (resources relating to just intonation and tuning theory): <http://www.dnai.com/~jinetw/>

O.O. Disks (record company with a commitment to acoustic exploration):
<http://www.hear.com/o.o/>

Other Minds (the San Francisco music festival):
<http://www.otherminds.org>

Pauline Oliveros Foundation (where the concept and practice of deep listening are being developed):
<http://www.tmn.com/oh/artswire/www/pof/pof.html>

Sonic Architecture (sound sculpture and installation artists Bill and Mary Buchen): <http://www.interport.net/~sonarc/maintext.html>

World Forum for Acoustic Ecology (resources relating to environmental sound and awareness thereof):
<http://www.interact.uoregon/MediaLit/WFAEHomePage>

There is also a usenet newsgroup for musical instrument makers at rec.music.makers.builders.

You can find many more sites relating to your topic of interest through one or another of the web search engines such as Yahoo, America Online's Web Crawler, or Alta Vista. Most web sites will also direct you to other sites on related subjects.



Experimental Musical Instruments, in conjunction with Tai Hei Shakuuchi, has been making available a booklet on principles of wind instrument design, called *Air Columns and Toneholes*, by Bart Hopkin. Lately we've been including an "Additional Information" packet containing new information with

each copy we send out. If you were one of the earlier purchasers and didn't receive the packet, let us know and we'll send it along. For more information on the booklet, see the ad in this issue's "Notices" section.

CORRECTIONS

We never make mistakes! However ...

In the article "Tweak Those Tones!" by John Herron appearing in *EMI*'s March issue, we gave John's address incorrectly. The correct address is 3635 South 544 East, Salt Lake City, UT 84106. Apologies to John and to anyone who may have had difficulty reaching him at the faulty address.

We also did that same thing to ourselves, allowing an incorrect character to slip into *EMI*'s web site address as given in the last issue. The correct *EMI* web site address is:
<http://www.thecombine.com/emi/>

In the "Ramblings" column in the December 1995 issue, we gave a phone number for the industrial surplus mail order company, American Science and Surplus. That number has since been changed. The new number is (847) 982-0870.

See also the letter in these pages from Dr. Guy Grant for corrections relating to last issue's article on didjeridu.

COMMUNICATING WITH US

POST: PO Box 784, Nicasio, CA 94946

VOICE PHONE: (415) 662-2182

FAX: Same as voice phone
 If our fax machine (which is temperamental)
 fails to respond at first, try again immediately.

E-MAIL: ExpMusInst@aol.com

WEB SITE: <http://www.thecombine.com/emi/>

LIQUID PERCUSSION

An Interactive Installation by the Composer/Sound Sculptor TRIMPIN Plays Music for the Rainy Season

By Jake Seniuk

This article originally appeared in the Late Autumn 1995 edition of *On Center* (Vol. VII, #4), the quarterly program guide of the Port Angeles Fine Arts Center. It appeared in conjunction with Trimpin's exhibit of *Liquid Percussion* at PAFAC from December 3, 1995 through January 21, 1996.

As the cold rains of the Olympic winter beat staccato rhythms upon the picture windows of the Port Angeles Fine Arts Center, another form of precipitation — falling *inside* the building — taps out a competing tattoo. Plump drops of water drip from a hundred valves suspended overhead on a grid of PVC pipe. The pacing of the drips percolates with shifting rhythms that, unlike the rain outside, are not under the auspices of a self-regulating Nature.

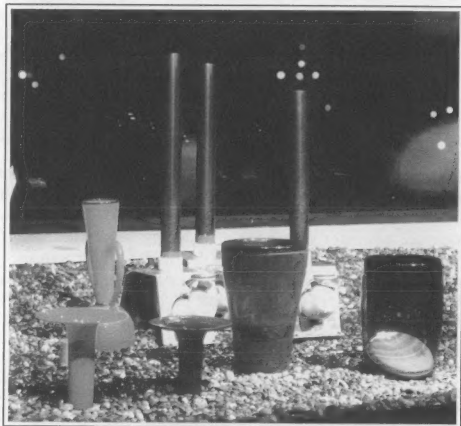
Instead the order and speed of their succession is sequenced by human commands. This *faux* rain drips along precise trajectories to strike colorful glass resonators which are positioned below, strung out on an elevated moat. Each valve releases a standardized droplet on demand: either manually through a specially-designed piano keyboard that is operated by the viewer; or automatically, by signaling a hidden computer to activate a sequence of programmed or "composed" events.

The resonators which sound out this strange music are hand-blown art-glass vessels from the studios of Dale Chihuly, Dante Marioni, Dick Weiss and other noted Northwest glass artists. In their new context these elegant and sleek pedestal pieces now sit somewhat unceremoniously on display — like exotic beakers in some strange experiment.

Novel "instruments" — they glisten seductively with both the liquidity of light and the glassiness of water. Their sparkling colors make visible their differences in tone. Each has been selected and tuned to achieve a specific timbre, a characteristic voice in a choir of leaky faucets.

This is *Liquid Percussion*, a sound sculpture by an artist and composer who goes by a single name — Trimpin — and whose madcap installations have been garnering wide attention in the United States and Europe over the past decade. Seen previously in San Francisco, New York and Switzerland, *Liquid Percussion* has now been adapted to the aural and visual space of Port Angeles Fine Arts Center for its Northwest debut.

Like so many immigrants before him Trimpin came to America in search of opportunity. But whereas earlier generations had traveled ever-westward looking for reformed gods or manifest destiny, Trimpin came in search of junk. In his native Germany he had had consistent difficulties finding the high tech cast-offs which are the raw materials of his art. The more frugal European nature,



molded by a long history of intense competition for space and resources, tends to draw out all the life from each good and artifact.

"In Europe you have to buy it all new," laments this now forty-something artist in an accent as thick and rich as his full woodsman's beard. "It's too expensive there to work as I do. Often I have to cut a piece of equipment in half just to try it. And then, again, it may not work."

Descended from a long line of Black Forest tinkers and inventors whose credits include the invention of the alarm clock, Trimpin lives in a universe of spare parts. His studio, in Seattle's Wallingford district, is located in a former phone company building that now houses an eclectic assortment of glass-blowers, writers, actors, musicians, designers and other creative types.

The tall walls of Trimpin's space are festooned with the bells of brass horns and hunks of serpentine woodwork — sousaphones and cello cannibalized from the traditional orchestra. And vying for equal space in this marvelously crammed workshop are the soldered entrails of micro-circuitry and orderly banks of electronic components — the carcasses of old computers and assorted communications hardware.



Below:
Trimpin
playing
Liquid
Percussion
at the Port
Angeles
Fine Arts
Center.

Left and on
previous
page:
the glass
receptacles
into which
the droplets
fall.

Photos by
Jake Seniek

"As a kid I had my own workshop and tools," recalls Trimpin, whose father was a brass and woodwind player. "I was constantly cutting instruments up and exchanging sections. When I studied the flügelhorn I wanted to make a longer bell, or increase the length of the tubes."

Trimpin received classical training in music throughout his childhood and adolescence. He also pursued his mechanical imagination by studying metal work and electronics in trade school. Later, at the university, he sought content for his technical skills by pursuing a joint degree in music and psychology, and he soon became interested in using music for occupational therapy.

The kinesthetic effects of music upon the body had fascinated the artist from an early age. "One day when I was eight," he reminisces, "my father said, 'Let's go in the forest and play some music.' It sounded strange but I said, 'I guess I have to go.' It was a great experience. ... not very interesting music, simply duets for flügelhorns. But those echoes! I will never forget this first awareness of what acoustics are. From that point I was always determined to go beyond what you could play normally."

Going beyond what you could play normally meant devising instruments which responded to a whole new set of stimuli, both human and automated. One of his earliest musical inventions was a light-sensitive keyboard for disabled patients, who could play it by moving a light pencil with their mouths. A three year stint in the Berlin theater allowed him to work in both set design and musical accompaniment, further melding the visual and the aural in his artistic vocabulary.

When he came to the United States and its treasure holds of "good junk," Trimpin was ready to explore added dimensions in listening. By now music had become for him not just a matter of inventing melodies and harmonies, but of design-



TRIMPIN DISCUSSES HIS WORK

My work is an ongoing exploration of the concepts of sound, vision, and how they can combine to cross the threshold of another dimension of perception: creating automated (non-synthesized) sound-producing sculptures that interface with the computer/MIDI equipment. Although I use the latest technology available, the outcome is not ultimately electronic — it is completely acoustic.

By positioning the sound sculptures in certain locations in a space or room, visual and aural perceptions of the viewer are synchronized. All of these elements build up to a constellation of experience: that of seeing, feeling, hearing.

Since I work with all the natural elements, I'm always challenged to push them to the limits — and beyond — of what we traditionally think of as their role. So it's possible to create something of a phenomenon using water, air fire, light, etc. in a way that transforms and extends how they are received by our senses.

Many of my concessions have acknowledged and supported my interest in these new genres — encouraging the development of original ideas and exploration of these mediums. In most projects, I've had to develop my own technology, because there was nothing commercially available that could be used for my particular expectation.

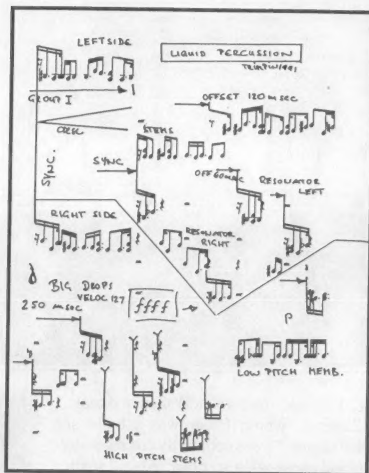
I am continually seeking new forms of expression, but many times using methods that may actually be ancient in origin — a tuning system that may be a thousand years old, for example, or using a computer to achieve acoustic, rather than synthesized sound. It is these very contradictions which give my work an ambiguity that piques the imagination of the viewers and continues to stimulate my own.

Trimpin was born in Istein, West Germany in 1951. After formal studies in music, engineering and psychology he worked at Berlin's Theater Zentrifuge before moving to the U.S. in 1979.

His installations have been shown widely at art and science museums in North America and Europe. Sites include New Langton Arts and the Exploratorium (San Francisco); the Walker Art Center (Minneapolis); the Brooklyn Academy of Music, Lincoln Center, the Kitchen and the Hall of Science (New York); the Museum Technorama (Winterthur, Switzerland); the Stedelijk Modern Art Museum and the Sweelinck Conservatory (Amsterdam); and at the Festival Arte Virtual (Madrid).

He has won many grants and commissions from institutions including the NEA, the Goethe Institute, the Washington State Arts Commission, the Lila Wallace - Reader's Digest Fund, WESTAE, Artist Trust, Art Matters, On the Boards, Apple Computer and MGM Media.

He recently completed a major Seattle Arts Commission permanent installation for the Seattle Center's new Key Arena.



A page from the score for *Liquid Percussion*

ing aural spaces.

Just as sculpture brings painting into the physical realm, Trimpin's musical sculptures bring an added dimension to music/sound. Conventional forms of music utilize tone, pitch and tempo to affect an abstract language akin to mathematics, which can be endlessly translated and transformed by an infinity of players and instruments. Trimpin's music, on the other hand, is site specific and imbedded in a physicality that is non-transferable.

His process of composing involves not just inventing a new notation system for structured sound, but also inventing the instruments on which that notation is performed. His instruments are electronically activated, through a variety of sensors and computer relays. Yet the sounds they produce are wholly acoustic. He uses no speakers, amplifiers or pre-recorded elements, preferring natural tones and timbres.

These are produced "live" through the articulation of altered musical instruments, natural materials, manufactured found objects and, sometimes, the forces of Nature. Setting his aim as "the extension of human ability," Trimpin blurs the distinctions among the human, the natural and the constructed.

Trimpin was drawn to Seattle in 1979 for its low cost of living and the prevalence of high tech industries in the Puget Sound region. Seattle's relatively slow pace, *laissez faire* livability, Defense-bolstered economy and ample metropolitan amenities, proved a fertile ground for the development of an art form whose time had not quite yet come.

Technological obsolescence and production waste provided a wealth of cheap resources with which to experiment. The Kent Boeing surplus store alone, a long favorite of Trimpin's and many other Northwest artists working with sculpture, assemblage and electronics, yielded everything

from super adhesives and odd screws to titanium panels and electronic hardware, at factory prices.

With a bow to the functional aesthetics of industry Trimpin alleges, "My main interest is in what the instrument has to put out for a sound. How they look is just a by-product of making an instrument that must sound a particular way."

However the grace and formal beauty of works such as *PHFFT-ARGGGH* or *Floating Klompen* belie this assertion and demonstrate the aesthetic wholeness of the artist's vision. In the former, commissioned by the Portland Art Museum in 1992, the viewer is surrounded by an armada of whirring, whooshing, and bleating wind instruments, which are activated by computer controlled air valves adapted from a juice machine. Responding to the viewer's motion these futuristic creatures composed of tubes, pipes, reeds and vessels emanate an eerie song which awakens their hominid forms.

The "klompen" of the latter are 120 Dutch wooden shoes floating in a pond at the Jan van Eyck Art Academy in Maastricht, Netherlands. Each shoe is fitted with an internal clapper that is connected by concealed wires to a controlling computer. As the sunlight sparkles and reflects off the surface of the pond the scripted clacking is spontaneously altered. It is difficult not to compare these bobbing floats to Monet's *Water Lilies* which were also energized by light on his canvas.

Trimpin's quirky contraptions recall something of the Dadaists, who beat cooking pans to accompany their poetry of exile, not far from the artist's boyhood home. But they are also the descendants of cuckoo clocks which had chimed in the tidy gingerbread cottages of Central Europe.

Trimpin combines the spirit of the artist with the intellect of the scientist. "In creating *Liquid Percussion*," he writes, "I am demonstrating natural acoustical sounds — that of falling water — in a different context. Several components combine to achieve this 'pure' sound: water is released through magnetic fields, gravity causes it to fall at a certain velocity from a particular height, striking a natural medium (glass, metal, etc.) and finally results in the sound waves being perceived as pitches and timbres. However, although the physical aspects of *Liquid Percussion* are very intriguing, it is primarily enjoyed by people of all ages because of the colorful visual impact and melodic, percussive sounds."

When he was a child Trimpin's father built a water wheel in a stream near their house. The wheel beat on two sardine cans and Trimpin was mesmerized by the "unfixed rhythms of the water" contrasted with the precise composed rhythms he was studying in his formal musical training. His dream was soon to "have a hundred water wheels." *Liquid Percussion* is a convincing manifestation of that dream.

Emil Richards belongs to the Percussive Arts Society

"The PAS is happening! I've found many of the wild percussion instruments in my collection through PAS sources, plus it keeps me up on all the percussion happenings. If you are a percussionist, the PAS is a 'must' in your life."



You can belong, too. Write or call for membership information today: Percussive Arts Society, P.O. Box 25, Lawton, OK 73502 405•353•1455

Jake Seniuk is director and curator of the Port Angeles Fine Arts Center, the Olympic Peninsula's art museum. Since 1989 he has brought contemporary art to the edge of the map, curating over 40 exhibitions in diverse media including *Liquid Percussion* and *Musical Variations*. He can be reached at 360/457-3532 or at PAFAC, 1203 E. Lauridsen Blvd., Port Angeles, WA 98362.

The articles that follow are the final two in a series of four on the making and marketing of unconventional musical instruments. The first two in the series, appearing in our last issue (*EMI* Volume 11 #3, March 1996) consisted of an introductory overview, followed by an article from Richard Cooke, maker of the highly successful *Freenotes* percussion bars as well as beautiful one-of-a-kind instruments made on commission. In this issue we start with an article from Dave Strohauer of *Earthshaking Percussion*, which operates a retail store and mail-order catalog full of unusual and irresistible instruments created both in-house and by other makers. Following that is an article from Tim Anderson and Janet Powell, founders of *Fascinating Rhythm*, creators of innovative percussion instruments focusing on the educational market in New Zealand.

SELLING UNUSUAL MUSICAL INSTRUMENTS: ONE APPROACH

by David Strohauer

Chances are good that everyone reading *EMI* has at least some experience with standard musical instruments such as a guitar, flute, piano or saxophone. We've all seen these instruments played, and possibly have tried playing them ourselves. If someone were to ask where to buy one of these instruments, most of us would have little trouble directing them to a local music store where all manner of standard instruments could be found. If you are a regular reader of *EMI* then chances are also good that you have at least tried to make an unusual instrument of your own design. The pages of *EMI* have been full of new and unusual instruments by dozens of talented makers since the first issue. Until now, however, no one has addressed the issue of how to market and, hopefully, sell these often strange creations. In this article I will share what I've learned over the past couple of years of making and selling unusual percussion instruments. But first a little background information.

IN THE BEGINNING...

I can remember two things from my childhood that have continued to affect my life to this day. The first was a love of building. I had Tinkertoys, an Erector Set, a Junior Drafting set (with that cool Pantograph arm) and a plastic Bridge and Girder set. So from about the age of three I was designing, planning and *building*.

When I was about eight years old a pivotal event occurred. One of my friends brought home a concert snare drum from school. Ever since I've been fascinated by the whole family of percussion instruments. I think this fascination is nearly universal, although not everyone will admit to it. For me, the sound and the appearance of percus-



Above: The front porch turned into gallery at Earthshaking Percussion.

Below: Clay pot drums made for Earthshaking Percussion by Mark Rademacher of EarthRhythms.



sion instruments are equally appealing. The more I learn about them the more I realize just how much more there is to learn.

A False Start

As a young man in college I was a little unsure of what to study, starting first in electrical engineering but quickly transferring to music. Very quickly! Of all my music classes, I think my favorite was "The Physics of Speech and Music." I didn't know it at the time but this class, one that most other music majors loathed, would prove to be the most beneficial to me in later years. (Thanks Dr. Knave!)

After college my days were free, so I started a small business doing custom woodworking, gradually acquiring jobs, tools and experience. Usually in that order. Nights, I played drums in local cabarets and nightclubs. I often thought about the possibility of actually making a drum, or perhaps just a woodblock. I never really tried, thinking that even though something looked simple it really couldn't be if it made sound.

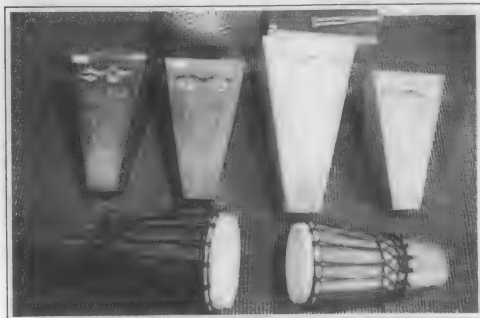
The First Order

A couple of years ago the leader of the Atlanta Percussion Trio told me about a show the trio was preparing that would feature



Above: Senegalese balafon, rattle from the Cameroon, American-made djembe and two ashikos, along with an Earthshaking T-Shirt made for Earthshaking Percussion's grand opening/open house party.

Below: Cajons and Ashikos



home made instruments. The guys in the Trio made all sorts of noise makers, pot lid-o-phones and plastic trash bucket bass drums. The one thing they lacked was something melodic with which to open the show. Something just a little more refined than the plastic trash bucket but still sort of home-made. When he asked me if I could make a small bass marimba and a portable xylophone that could be slung around the players' neck and allow him to move around a little, I remembered seeing a drawing of a xylophone bar in Jon Scoville's book *Sound Designs* [Ten Speed Press, Berkeley, CA, 1980; revised 1995] that showed how to do the "tuning thing" and I said "Sure, no problem."

That's how I began trying to make a living by building musical instruments. The box resonated marimba and xylophone I made turned out fairly well and I think they're still in use to this day. If you are interested in making this type of instrument I highly recommend, in addition to *Sound Designs*, Christopher Banta's two books, *Basic Marimba Bar Mechanics and Resonator Principles* and *Marimba Bar Fabrication and Tuning*. [C.C. Banta — Creative Percussion Company, 232 Wyoming St., Pasadena, CA 91103, 1982] (Of course, I didn't discover either of these invaluable references until long after the project was completed.) Musically, the xylophone was probably the most successful of these two early instruments, due to much easier tuning, but the eight note pentatonic marimba was much more fun, and funky, to play. It is tuned starting on the C two octaves below middle c. I never could quite get the overtones tuned right and with a simple box for the resonator those non-harmonious overtones played a bizarre counter melody nearly as loudly as the fundamental tone below it. The trio members liked it and thanked me for making it sound especially home-made.

BRANCHING OUT

At about this point I began thinking that if I was ever going to earn any money making and selling instruments, I might do better, or at least as well with a lot less work, if I started selling other people's instruments too. It seemed to me that I could promote someone else's instruments just as easily as my own. Thus, with little fanfare, an understanding girlfriend and several good credit cards, Earthshaking Percussion was born. My goals were simple. I wanted to offer the widest range of percussion and exotic instruments at a fair price. And to provide support and education to folks buying something they often knew little or nothing about other than that they liked it.

Perfect Timing

In my woodworking profession, I had been thinking for some time of offering some kind of limited production product that would gradually ease me out of contract work. Something I could design and build myself during slow periods in the shop. I had considered a line of wood deck furniture and planters with a Wrightian flavor, lamps with cast iron bases and Hinoki cypress veneer shades, and Arts and Crafts period reproductions. I still feel they're good ideas, but nothing clicked. Until I found the didjeridu.

The Product Line

The didjeridu is not a percussion instrument. None the less, the first time I saw one I fell in love with its sound, the same way I did with that first drum when I was eight. The didjeridu is an Australian Aboriginal bass wind instrument made from a

hollow tree trunk or limb 4 to 6 feet long. They have been played by Aboriginal folks for thousands of years. Being a relatively non technical culture, the Aboriginal didj makers relied on termites to do most of the hollowing out process.

The first didj I got was made in the U.S. of bamboo with a very large bamboo mouthpiece. So large, in fact, that when played it closed off both of my nostrils from below and made the elusive circular breathing technique nearly impossible. I decided to see if I could refine this bulbous mouthpiece and ended up making a whole line of ABS plastic didjs, tuned chromatically over an octave range. I tuned my didjs chromatically, and carefully, because I wanted them to fit in with more common western instruments like the ones mentioned at the beginning of this article. The Aboriginal didj is often decorated with painted art depicting animals or other figures of importance to the maker. They call these Totems. I decided to decorate my didjs, making a conscious effort to not "borrow" any Aboriginal art. The final step in making my didj is fitting a natural beeswax mouthpiece which provides a more comfortable fit between player and didj, without blocking air flow. When finished, the didjs are matched to a cloth gig bag, sewn locally, and are then ready for sale.

MARKETING

But how and where does one go about selling such a thing? Or any other off-beat musical instrument? That's a question I've thought about every day for the last two years. In the next several paragraphs I'll detail some of my thoughts on marketing, advertising and selling.

Consignment

I've found that direct sales and mail order sales to the end-user are the most effective and profitable for my products although I've had some success wholesaling to "new age" shops. The one serious drawback to retailing your instruments in a shop is that they will pay you only 50% to 60% of the retail price. I'm not suggesting that's an unreasonable amount, because I wouldn't consider a product for our line that offers less margin, but it is something that must be planned for in advance when you price your instrument. Consignment is also an option I experimented with before we opened our own gallery. Consignment means that a retailer receives your product and displays it for you but does not pay you until after it sells. This is a common practice in the fine art business where the gallery will show the work of one or more artists for period of a month or two. At the close of the show all unsold work is returned to the artists. This arrangement may work fine when dealing with expensive artwork but I don't think it works for instrument makers. On the other hand, when consigning you may receive a greater percentage of the retail price due to the fact that the retailer has no investment in the product. My experience has been that a shop that will only take your work on consignment either does not have the cash to buy your product outright or they don't really believe in your product. Neither of these situations is good for a struggling instrument maker. The end result is often very slow sales and damaged, then returned, instruments. For example, a little over a year ago I put five didjeridus on consignment in a local art gallery. The owners had just opened their shop and were eager to fill it up with 'cool' stuff. After 13 months of sitting in the shop, being mistaken for very quiet rainsticks and then blown on by half the population of Atlanta, I brought them all home. All were scratched and dinged and most needed new mouthpieces. At Earthshaking Percussion,

we accept only used instruments on consignment, usually in partial trade for a new instrument. I would recommend consigning new merchandise only if you're desperate for people to see your wares.

The Fine Print

One way to get your work in front of a lot of people is to advertise in magazines such as *EMI*, *DRUM!*, and *RhythmMusic* which have music, world music, or drumming as their focus. I've tried, and am still trying, to create an ad that huge numbers of people respond to. On the whole our ads have generated little response and considerable expense. Interestingly, of all the ads we've run, ranging in cost from \$20 to \$900, the most successful so far is the *FREE* classified ad in the back of *EMI*. Nevertheless I'll continue to advertise because I feel it's important to create an image of what my business and instruments are all about in the minds of people that I can't talk to directly. I guess that's the goal of advertising in general. The problem, it seems, is that most folks looking for a didj or other exotic instrument would like to hear it before buying and so far I've been unable to design an ad with sounds. Which is exactly what we're planning for the World Wide Web. More on that at a later date.

Tooting Your Own Horn

Most people are timid and reluctant to try an odd new instrument, especially in front of a stranger. As a result I've had to become proficient on a wide array of drums, ocarinas, didjeridus etc. in order to show someone that an instrument can actually make music. Interestingly, these sonic demonstrations often take place over the telephone. My motto has become "If I can't play it, I can't sell it". The Afro Cuban Cajon is a good example of this philosophy.

The Cajon is an all wood box drum made and played in many parts of the world. Most people who see it mistake it for a very 'tippy' end table rather than (in the right hands) a wonderfully expressive drum with deep ties to the Caribbean and Africa. The Cajon is directly descended from wood shipping crates which were common throughout the world prior to the invention of the cardboard box. These crates, of various sizes and shapes, were pressed into service by African slaves after the outlawing of their traditional drums by the various colonial governments in the New World. While the Cajon is perfectly suited to playing Rumba or many other indigenous musics, it also makes a very versatile hand drum for drum circles or small group playing. It is by nature not a loud instrument, having evolved as a drum family to accompany unamplified singers. Considering its relatively low cost and ease of playing I feel the Cajon has the potential to become as popular as conga drums, or at least Djembes and Ashiko drums. However, if I couldn't play the cajon convincingly, most people would have a hard time getting past the "tippy end table" stage in their perception of this simple and unusual instrument.

Do It Yourself Marketing

If consignment is out and advertising too expensive, what do I recommend as a positive, affordable method of getting a musical creation out into the world? Here are some low-cost marketing ideas that have worked very well for us. First, I always try to take one of my instruments with me in the car wherever I'm going. I usually have at least one didjeridu and maybe a frame drum or cajon with me at all times. This allows me to always have the thing close at hand to practice on. Remember my motto! Second, you never know who is going to see you and your instrument. For

example, I was in Office Depot one day looking for an answering machine. The sales guy asked what kind of business I had. When I told him I had a drum gallery the expression on his face fell. He said "Oh no.....Now I'm going to have to spend lots of money." And he did, buying almost \$1500.00 worth of dumbbells, tarts, didgeridus, ashikos and TubeATones in a two month period. Thanks Andrew! Another great way to promote your instrument at very low cost is to take it out in public and play it. Some of the obvious "venues" are the local park, open mic night at a local pub, arts and craft fairs and local radio shows. Make sure you have your catalog or business card with you and hand them to everyone who will take one. By the way, if you are attempting to sell your instrument, you really should have an answering machine on your phone that identifies you and your business or instrument. Many folks, myself included, are reluctant to leave a message if all we hear is 25 seconds of the latest Metallica single or Jim Rockford's "Leave a message and I'll get back to you".

Catalogs

There are two other items that are very valuable and should be considered by anyone making a musical instrument to sell. I feel a catalog and business card or at least a flyer with a photo or clear drawing of your instrument is invaluable. The Earthshaking Percussion catalog, which until recently was only a fold quad brochure, has grown to twelve pages with fourteen photos of over a hundred instruments, with separate sections for recordings and instruments. Most importantly, it contains our address and 800 number for toll-free ordering (given at the end of this article, if you were wondering). With the desktop publishing power available today, it should be easy to find someone to do a brochure or small catalog, possibly in exchange for one of your instruments. As a technical matter, we've had great results using a Docutek imagesetter for all of our printed materials other than cards, letterhead and envelopes, which are printed on an offset press. We could have used the Docutek for cards and letterhead but our logo uses two colors, which the imagesetters cannot print. The advantages of this type of printing for low to medium volume, up to about 5 thousand pieces, are many. Because imagesetting is an all digital printing environment, last minute changes and additions are easy to make and you eliminate the expense of traditional films and plates. Resolution for text and graphics is very high and most paper stocks can be used, but check with your printer before buying paper to make sure the machine can handle what you want to run. At present, color output is available, but is most commonly used to proof four color process material before going to press. At about \$12 to \$50 per page, it's too expensive for our purposes but the cost is going down all the time. For example, one of my suppliers of Nigerian percussion instruments, a company called Rhythms, produces their own color catalog in-house (literally) on a desk top computer and a Hewlett Packard Color Laser Printer. The results are quite good and show the rich colors and textures of their products. At Earthshaking, we print three catalogs a year with new photos and copy, in quantities of about a thousand, and incur minimal set up charges. Contact your local computer service bureau for more info on imagesetters.

A Show Room

The second thing that I think is vitally important is to have a space in your home that you have dedicated to displaying your instrument. If you have only one or two products, a corner of a room where you can leave your instruments set up and ready to

play is probably sufficient. However, in the first year of Earthshaking's existence, we had stuff scattered all over the place. Usually, a drum would be in one room and the proper stick in a box in a different room. Some things were out on shelves in the living room, some in the office, (which is always a gross mess), and some stuff was packed away. As our inventory grew, it became clear that we had to have a gallery to do our drums justice. And to keep our sanity. Fortunately, we had the space; an unused 200 sq. ft. screened porch at the front of our house. It took about three weeks of work scrubbing, painting, building display shelving and windows and installing "gallery" lighting but it was well worth it. Not only did the gallery increase sales but it also helped in getting the rest of our house back. The visual impact of opening a door to a glowing room full of percussion treasures is invaluable. A commonly heard reaction is "Wow, this is like a toy store for big kids. I love it!" And, perhaps more importantly, we love it too.

Call First!

Early on we decided, since we are working in our home, to open only by appointment and to not widely publicize our home address. Our business cards and all catalogs show only a PO Box number and, of course, our phone number. This allows us to manage our time better than if we had folks dropping in at random, or worse, arriving right after we ran out to the video store. It prequalifies them as someone who is serious about purchasing an instrument. With our by-appointment-only policy and the new gallery, we make a sale about 95% of the time.

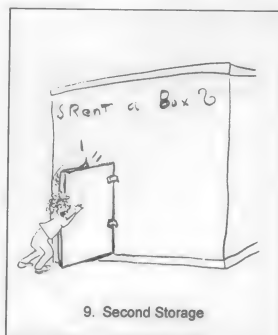
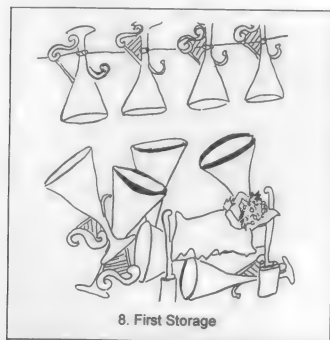
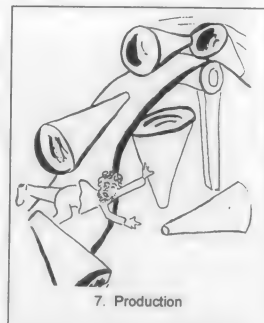
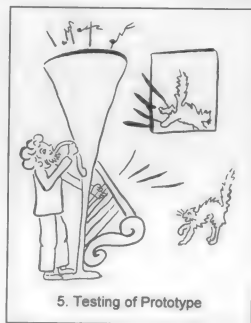
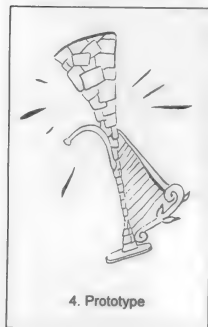
THE BOTTOM LINE

As I mentioned earlier, we've been operating Earthshaking Percussion for about two years now. Every day I learn something new and meet another curious musician or two. And I'm more excited about what I'm doing and making. Financially, we're doing much better than I could have hoped. The demands on my time have started to cut into the woodworking business, even though that enterprise is still profitable. At some point in the future I'll have to give up cabinet work, building fences in the rain and hanging crown molding in rooms full of furniture and china lamps. The sooner the better!

I hope I have provided some useful tips and maybe some inspiration to anyone considering selling their musical instrument. I think there is a market for almost everything that makes sound. Our task as makers and sellers of musical instruments is to find people who might want our instruments and get them to listen and try. If you have made a good instrument, it should sell itself.

I welcome any thoughts or comments you may have regarding the business of selling musical instruments and I would love to hear from anyone who feels they have a product suitable for Earthshaking Percussion.

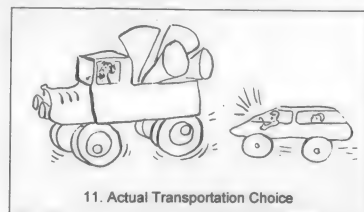
David Strohauer's extensive experience in the art and craft of instrument making and marketing eminently qualifies him as a contributor to this series. For a catalog or more information from Dave Strohauer's Earthshaking Percussion, contact Dave at PO Box 18372, Atlanta, GA 30316. You can call or fax at (404) 624-3349, and the toll-free number for orders is 1-800-646-6795 extension 7262.

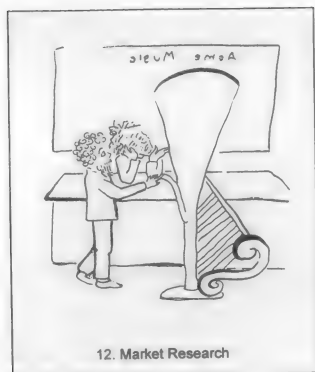


MARKETING FOR YOUR
NEWLY INVENTED MUSICAL INSTRUMENT

From the Moment of Conception
to the Attainment of Success

As conceived by Robin Goodfellow, graphic artist.





FASCINATING RHYTHM Innovative Percussion Instruments

by Tim Anderson and Janet Powell

BEGINNINGS

Marketing unconventional musical instruments is basically little different from marketing breakfast cereal or automobiles.

How can we possibly compare the work of art that you have produced, which sounds great and looks wonderful, to a packet of corn flakes or a Toyota? Three years ago we asked exactly the same question. Surely there is no comparison? What we produced was.... welljust different.

It would be two years before we finally realized that we were mistaken. Mistaken is perhaps a bit harsh. A better explanation might be that we naively believed that because what we produced was so different from other products all the marketing strategies we read about obviously did not apply to our business. It was a long slow process that eventually showed us that despite there being some specific problems associated with selling a hitherto unknown musical instrument, on the whole marketing is marketing.

Perhaps we should take time out here to tell you a little about ourselves. We live and work in Christchurch, New Zealand, which, for those of you who don't know, is a small country of 103,736 square miles in the South Pacific Ocean. New Zealand is made up of two islands, imaginatively named The North Island and The South Island. Christchurch is the larger of the two major cities in the South Island and has 350,000 people. Auckland, the largest city with one million people, is at the top of the North Island about 800 miles from Christchurch.

Both of us are trained as teachers and had at the outset little woodworking expertise and no business experience.

Three years ago we accidentally got into the musical instrument business after Tim made a tongue drum (also known as slit or gato drum) as a project at teacher training college. A friend who was teaching took it to her school to show them and returned to say that the school would like to buy it. This was obviously encouraging and after selling a few more drums around the local schools we decided that we should adapt some other unusual instruments for use in schools.

MARKETING

We were fortunate in this respect in that we knew precisely who our market was, how to contact them (there is a database in New Zealand with every school listed including the number of students in attendance), and, because we had teaching experience we had a good idea of the things teachers would be looking for from/in an instrument. Our teaching experience also lent us credibility especially as we both also have university degrees and have done post-graduate work in education.

Knowing how to reach our market in such a small country was of course vital. However it does not matter how large a population base you have. It is imperative that you can recognize your target market and know how you can most effectively access them. It

simply is not good enough to have a good idea and believe that 'somebody' will want to buy it.

Because we had identified our market we were able to go to some teachers that we knew and show them prototypes and ask their opinions. We gave instruments away to selected people to use (usually to teachers who were advisors who we knew would show our instruments to other people). There are two important lessons here. Firstly talk to people. Initially we talked to teachers, principals, music advisors, musicians, university and teachers college lecturers. They all had some sort of feedback for us. Usually positive but often with constructive criticisms. This leads to lesson two. Do not fall in love with your product. Obviously you have to believe in what you are doing but you must be able to accept constructive advice from those whose opinions you respect.

There are several other aspects that need to be addressed during the initial stages of starting a business.

PRICING AND EXPANSION

Getting your pricing right is imperative. This is not the place to go into all the aspects of pricing and our best advice is, if you can afford it, get an accountant to do it for you. We made several mistakes when we initially priced our product. The first was to set an realistically low hourly rate to pay ourselves. Even though we work sixteen hours a day six days a week many of these hours are not productive in the sense that you are actually working on building an instrument. Much time is taken up by research and development, machinery breakdown, collecting raw materials, getting quotes for printing, talking to customers on the phone and going out selling. One of the biggest problems in this regard was that we were spending up to half an hour wrapping and dispatching an instrument that took two and a half hours to make without building the packing time into the pricing.

The second mistake was that we did not build in a profit margin that allowed for expansion. We had initially visualized our business just being the two of us, but now realize that for a business to be successful it must be dynamic and that growth is an imperative. (Marx was right.) We are now on the verge of employing someone to help with polishing and packaging and other basic tasks. Other people we have met, who have their own small businesses, have also found that they have grown to the point where they have had to expand their premises and employ people.

PRODUCTION

At some stage you will need to think about where you want your business to go in the short, medium and long term as this will have a bearing on how you plan your manufacturing. You must decide early in the piece how you intend actually making

your product. Does it require a large number of hours to produce, using labor intensive techniques? It is fine if it does, but this will mean that the cost per unit will necessarily be high. Is your potential market big enough if you are producing a highly priced and very specialized musical instrument? If you get a big order will you be able to handle it? We know several people who have lost worthwhile orders and contacts through not being able to supply a large order within a specific time frame.

If you intend having a more mechanized system of production cost becomes a big factor. We slowly built up our plant and worked with the addition of each new machine that our processes got more efficient. For example a big table sander replaced a hand held belt sander. Despite some basic mechanization there is still a large labor component that has to be reflected in our pricing structure.

BUILDING THE BUSINESS

During the initial stages of our business we both kept working in our regular jobs. Janet taught and worked on a Masters Degree and Tim tutored at university and completed a Masters Degree. We made instruments after tea, well into the night, and on the weekends. Any money that the business brought in was pumped back into machinery and other equipment. We built things up very slowly as we are both cautious by nature. This minimized any risk. We initially did not borrow money and worked on a very small scale.

We started attending education conferences where we would have trade stalls. The interest in our product was always very high but because the instruments were reasonably expensive teachers had to consult their peers back at their school and we heard back from very few. Although all the praise and admiration of our instruments was very appealing for a while, we soon became conscious that praise was not going to pay our bills.

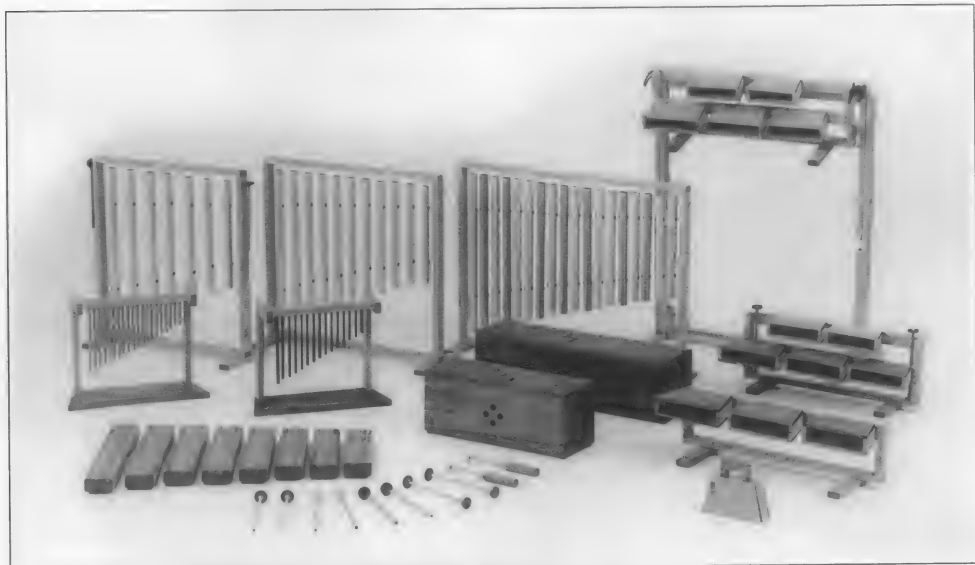
In the second year it was time for Tim to take up the business full time and for Janet to keep teaching so that we had some guaranteed income. We decided that as teachers were not buying the instrument after seeing them at conferences that the best approach would be to go to the schools and show as many staff members as possible so that they were all enthused about them.

For two years one of us would travel to another city for a week at a time and visit 40 or so schools, kindergartens (where children attend until age five) and early childhood centers (crèches) to demonstrate the range of instruments. We would write to the schools and follow this with a phone call before the visit to make a time. A couple of weeks after the visit if we did not get an order at the time we would write again perhaps with a special offer of a free instrument (we make one small hand held instrument for this purpose). This is obviously very labor intensive and very hard work. You really knew you had done a good weeks work by the time you had carried in four cases of solid wooden and metal instruments into 40 schools!

This worked well in that it let the potential customers see and hear the instruments for themselves.

TWO PLACES AT ONCE — BUILDING AND SELLING

The problem with this technique was that we did not have time to continually be away on sales trips and to build the instruments. We felt that we needed to make a choice between either selling the instruments and getting them manufactured by somebody else or to keep on doing the manufacturing and let others do the selling. The simple truth is that no one will be able to do either as well as you would and it ends up being a trade off. We have decided, with some trepidation, to hand the selling over to others and to continue



A selection of instruments from Tim Anderson and Janet Powell's company, *Fascinating Rhythm*.

manufacturing ourselves. This was mainly because we felt that we needed to be doing the building to ensure that the quality was maintained. As you will understand there is a great deal more to building an instrument than other items such as a book shelf.

PROS AND CONS OF RETAILERS

We have yet to progress far down this path and may, in the future, change direction if things do not work out wholesaling to retailers. Retailers in our experience are by nature conservative. In the music field most of them we have been in contact with basically want to import cheap instruments from Asia such as triangles, maracas, xylophones, wood blocks etc.; put a high mark up on them, turn a lot over and sell the customer more next year when the first lot are broken. They simply don't want to sell quality instruments that they can not put 80-100% mark up on.

Fortunately they are not all like this but it is important to realize that essentially they do not care whether your product sells or not because if it does not turn over to their satisfaction, without too much effort on their part, they will stop stocking it.

We have now reached the point where several big companies that deal in school music are stocking our products and we are looking at the Australian market as we are finding that New Zealand is simply not big enough for us to expand our business in the way we wish to.

A word of warning: If you have come up with a really good concept that can be viably manufactured and marketed it is inevitable that someone will copy your idea. Under New Zealand law there is not a great deal one can do about it without spending large amounts of money on a lawyer. The best course of action is to get really angry and kick the hell out of your bandsaw and then forget all about the people who have stolen your idea. If you are doing your job properly, manufacturing a good product and marketing it effectively, competition should not be a problem.

The truth of the matter is that although there are many basic rules with regard to marketing nobody can do it for you and it is very much a case of trial and error. The essential ingredient, we have found, without being too preachy, is that twenty percent of making a business work is the good idea and the other eighty percent is plain hard work and bloody-minded determination.

THE BASICS

We would just like to reiterate what we believe makes our business work. Know your market. Talk to anyone who will listen to your ideas. Listen to anyone who talks to you about your ideas. Believe in your product but don't fall in love with it. Take things one step at a time. Be flexible and don't take no for an answer.

Having read this you are possibly thinking that these two are a couple of soulless arseholes who only think about making money, refer to their instruments as 'their product' and would be just as happy selling real estate if there was a buck in it. Well perhaps you're right. However in our defense let us say that we care deeply about children's education and the part that music

can play in it. Especially with instruments as easy to play and as versatile as ours. And here is the salient point. Some people in our city set up a non-profit-making cooperative a year or so ago making one of the instruments that we make. Because we see ourselves as a serious business we're still here providing great resources for kids. They aren't.

Tim Anderson is a designer and builder of innovative percussion instruments. In 1991, he and Janet Powell, branched out from their teaching careers into instrument making. Tim's experience as co-founder of their company, Fascinating Rhythm, served him well in the writing of this article. For a catalog or more information, contact Tim at Fascinating Rhythm, PO Box 10-167, Phillipstown, Christchurch, New Zealand. Phone or fax: 64 (03) 3666 856.

TWELVE TREES (CARTA ECOLOGICA) *

Instrumentation

Twelve Trees, Spirits of a Tree

1. Roots	5. Branches	9. Fruit, berries
2. Trunks	6. Leaves	10. Beings who live in trees (primarily birds, insects)
3. Sap, juices	7. Flowers, blossoms	11. Wind (Solar)
4. Wood, bark, knots, fossils, fossils	8. Seeds, nuts	12. Rain, water (Lunar)

one person
Score
Shovel
pails of water(x)
Seeds and other food (bread, nuts)
* Twelve flowering and apple trees on campus at
Glenview, Philadelphia College, St. Peter, PA

- Water the trees. Begin at 12, then proceed to 11, then 10, until 1.
- After watering the tree at 1, draw with your hands on this tree:
In a holy tempo (Change to the Red-Headed Woodpecker)
11-7 11-7 11-7 11-7 11-7 11-7 (pause)
(repeat; this should be heard six times)
- Bury this Score in the ground beneath the grove of the trees.
- Leave seeds and other food by each tree. Begin at 1, then proceed to 2, then 3, until 12.

©Copyright 1992 Steve Heitzeg.

One in a series of Ecoscores created by Steve Heitzeg

FRED "SPACEMAN" LONG

Troubadour from the 26th Century

By Walter Funk

In 1952 Fred Long was 9 years old. There was a hit song at that time called 'Hot Canary.' It had played on the radio for several months. Within 'Hot Canary' were unusual sounds done on violin. Fred was inspired by these sounds, so he started studying violin. After much hard work, no results came. Fred explains, "I studied violin just because I wanted to play that song. One of the big disappointments to me in the playing of the violin was that I could not produce sounds that at all matched the sound of the 'Hot Canary'."

During the late 70s Fred was living in Cambridge, Massachusetts. He was involved in live performances with instrument builder Robert Rutman [see EMI Volume I #1, June 1985]. The two performed at Gallery East and other experimental venues. Fred would read poetry while Rutman played his Steel Cello and Bow Chimes. The Steel Cello is a tall instrument, standing around 6-7 feet tall. Around 1979 Fred asked Robert to build an instrument that was easier to walk around with. Rutman told him if he wanted one, he should build it himself.

While in a pawnshop Fred came across a 1938 Rickenbacker guitar with a broken neck. Electric guitars in those days did not always have a steel bar in the neck. With steel string tension they tended to break. Fred noticed the pickup was distinctive; it had two U magnets with a coil in between.

In 1980 Rutman's 50th birthday party was coming up and the Gallery East was holding a two-week run of experimental music to celebrate. This motivated Fred to start putting together *Kundalini*, his first instrument. He gathered raw materials that he had been collecting, along with the '38 Rickenbacker. He replaced the broken neck with a swirled piece of sheet metal suspended over the body. A string was attached to the swirl so you could squeeze the metal and modulate the string. Fred finished the instrument and performed with it at the Gallery East celebration.

Fred went on to build more instruments after *Kundalini*. *Vishnu*, for example, looked like a plexiglass tennis racket. It had a soapbar pickup at the top of the round part and a piece of bandstrap slid over the pickup. While in Cambridge, Fred "Space-man" Long explored different pickups and materials. Many years of exploration led to his recent and current works.

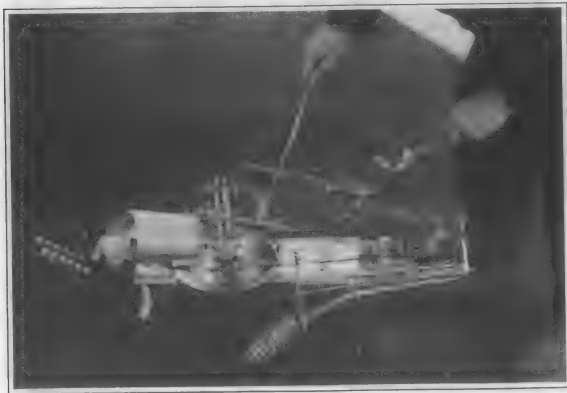
In 1990, Fred moved to Oakland, California. The experimentation continued. In 1992 he had a job doing deliveries for a Japanese sushi place: "We would cut up frozen fish and the saw would break every so often. I just took one of these bandsaws home. I said, 'Well, they violin the saw all the time, I wonder if I could do one with a piece of bandsaw and as I get it together, can I electrify it?'"

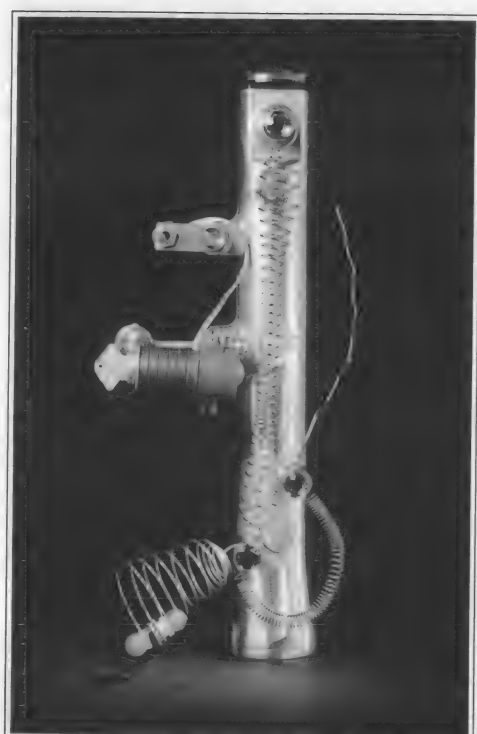
So how did it come out? Mr. Spaceman continues: "I put the bow to the thing and BANG this memory of the 41 years before when I go off to study violin purely to make the sound of ... and there it is ... I have recreated the sound of the 'Hot Canary', and it took me 41 years to do it." This was the birth of *Gabriel*. As can be seen in the photos, the bandsaw is only a small part of the final device.

Gabriel was then electrified after 14 different pickup designs were tried. It can be plucked, struck, bowed or whatever. Special strikers were made called twangers. The handle is a regular chopstick. A spring is attached at one end and a metal bristle from a street sweeping machine is intertwined with the spring. The twanger can directly strike things percussively but the spring gives it an added, extra flex. Rapidly wiggling can produce sustained tones on some parts of Fred's instruments, especially springs.

Other instruments after *Gabriel* are well-suited to be twanged upon. *Ulysses* uses a sheetmetal resonator to amplify its different sound elements. The sheet-metal resonator picks up vibrations from the various springs, gears, metal saucers, grates, saw blades, coils, curbfeelers, etc. and not only amplifies them

Gabriel, an early instrument by Fred "Space-man" Long, seen here under the hands of author Walter Funk. Photo by Fred Long



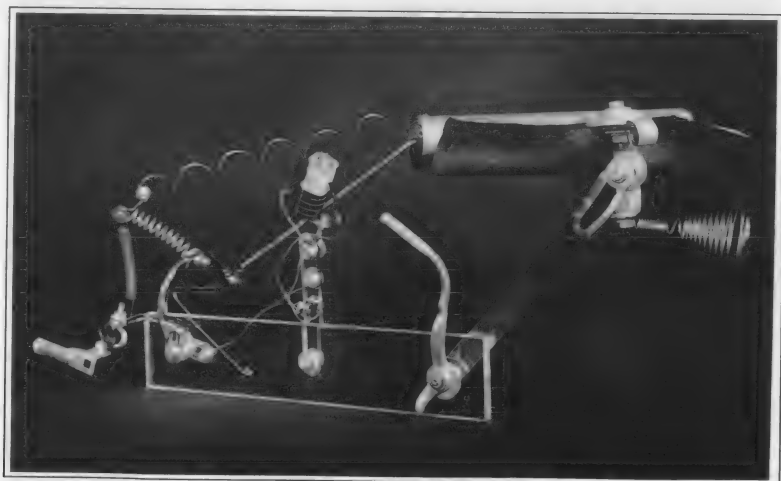


Instruments of the
Jokers series,
created by
Fred
"Spaceman"
Long

Upper Left: *Ulysses*

Upper Right: *Achilles*

Lower Right: *Posiedon*



Photos by Angus McGiffin

acoustically but shapes the tone. This is because it has its own resonant characteristics. An electric pickup attached to the lower part of Ulysses is pointed at the resonator along the thin side. The sounds range from metallic plinky sounds to Gamelan, akin to Giant Space Gongs. The springs produce pitched gong-like sounds and when the twanger is wiggled rapidly and lightly against them, controllable sustained pitched tones can be produced. Furthermore, rapidly wiggling Ulysses itself produces modulations. The pickup bends back and forth next to the resonator, creating spatially stretching effects. The large spring stretches when Ulysses is wiggled and when the large spring is struck, wiggling Ulysses produces a double modulation. This is very expressive.

Atlas also has a sheet metal resonator. It is spiral and can be seen in the photo on the front cover of this issue. The resonator can alter sounds as Atlas is wiggled. The outcome is similar to electronic flanging with a multi-layer Doppler effect.

Poseidon is a deep-sounding instrument. Its pickup faces a spring. Poseidon by now has transformed into something different than its photo.

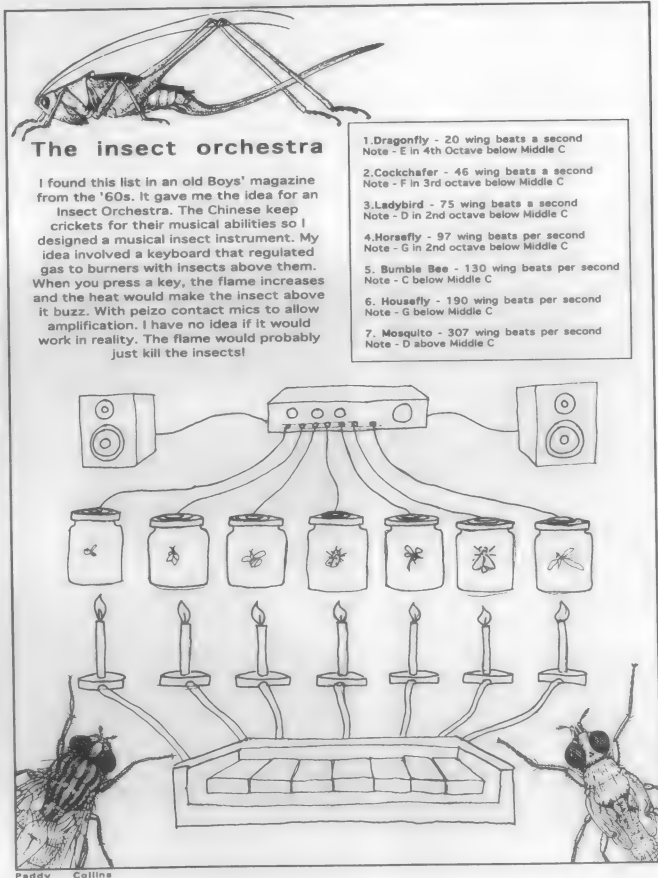
These devices make up the family of instruments that Fred calls *Jokers*. Recurring features include springs, sheet metal resonators, acoustic sound generation and processing, and electric pickups ... but they all have their own uniqueness. Each Joker has its own mechanical system, requiring practice to develop and then perfect playing technique. A certain understanding of modes of sonic warpulation can be acquired. I have performed on several of Fred's Jokers, sometimes using their sound energy to control Electroholoforms, 3-D animations floating in space.

Fred "Spaceman" Long occasionally gathers with other "Troubadours from the 26th Century" to perform around the San Francisco Bay Area. Jokers are used in conjunction with other strange electroacoustic and electronic instruments. The Guitar Family relates to the Joker Family: "These instruments evolved from the electric guitar the way the synthesizer evolved from the electric organ."

Walter Funk performs on a large variety of strange acoustic and electronic de-

vices. He appears on the recordings of Mandible Chatter, Oats, and Wovoka. Live performances include those with Fifty Foot Hose, John Cage's Music Circus at Stanford, Mandible Chatter, and of course with the Troubadours from the 26th Century. Mr. Funk has developed a new form of art using electroholoforms. Electroholoforms are real-time electronically generated hologram-like moving images, controlled by live music.

Walter Funk and Fred "Spaceman" Long can be contacted at Astrosonics, 2018 Shattuck #24, Berkeley, CA 94704.



"The Insect Orchestra," by Paddy Collins, first appeared in *Noise Gate* Issue 1 (c/o 20 Wake Rd., Nether Edge, Sheffield, S7 1HG, England). Reprinted here by permission.

ELECTROACOUSTIC COIL-SPRING INSTRUMENTS

By Eric Leonardson

When I saw the "Rambling" column in the December, 1995 issue of *EMI*, I was inspired to ramble about my electroacoustic coil spring instruments.

First, some background. When I attended the first Invented Instruments Workshop at Experimental Sound Studio (ESS), given by Hal Rammel in 1990, I created the utterly simple "spring can." It's just like a tin-can telephone with a coil spring instead of a string. The spring is screwed to the bottom of an empty one-gallon paint can. I play it by holding the can in one hand and the end of the spring in the other, while plucking it with my finger. Stretching the spring increased the pitch; low tension gave a low pitch. The sound was either a "ping," or if stretched immediately after plucking, a "ping-ong." Holding the can on the floor with my foot allowed me to use one hand for stretching the spring farther, for wider pitch difference, and my free other hand to play it with a violin bow. More effects were available when I attached a transducer to it, processing the output via digital reverb, equalization, and other effects. A couple of years later I was able to buy a used digital sampler, using that to expand the sonic possibilities of my instrument inventions.

Two years ago I built the "Springboard" to see if I could play a heavy, 1"-diameter, 10-gauge coil spring. I mounted it on a 2½' long, 2x6 wood board, installed a contact mic into the underside of the board, and wired it to a 1/4" phone jack installed to the edge of the board so I could hook it up to a mixer or amplifier. Plumbers' plastic lead seal holds the contact mic firmly in its hole, and it is sensitive enough to pick up the sound of whatever touches the board. In fact, it is so sensitive in the 1kHz range that I put it through my equalizer to de-emphasize it, while boosting the output around 125 Hz. An aluminum walker, purchased from a local thrift-store, provides an inexpensive and lightweight stand at a comfortable playing height.

The only information I can offer you about the contact mic is that I

purchased it at American Science and Surplus, over two years ago for about \$3. It looks like something that came out of the mouthpiece of a telephone handset. The manufacturer is Massa Products Corporation in Hingham, Massachusetts.

Some of the attachments to the Springboard include combs, flat hardwood sticks (a crude version of Hans Reichel's daxophone — see *EMI* Volume IV #3, Oct. 1988), and a small barbecue rack. (Because these pans are so inexpensive, partly retrieved from the garbage, I feel free to try anything on it without fear of wrecking anything.) On the left corner of the board a thin metal can lid is screwed on. A light-gauge coil spring is attached between the bottom of the can lid and one leg of the aluminum walker. I've

experimented with adding springs between the grill and the legs; to almost every possible spot on the Springboard. I also tried using thick rubber bands in place of springs and, with a lot tweaking, came up with some rich bass sounds. However, rubber bands had an extremely short life span. There's a 5-gallon version of the spring can propped between the legs of the walker. It has become a more or less permanent fixture on the Springboard. Conveniently, this can came with its own ready-made hole (originally the spout for pouring out water seal), which was just the right size for plugging a microphone into. So, in addition to the output of the board, I also have the mic'd output of this large spring can, which acts as both a resonating and reverberant chamber, receiving sympathetic vibrations from the board transmitted through the walker.

Using the violin bow on the large coil spring produces a sound that seems to modulate between changing pitches of varying amplitudes. Generally speaking: with light pressure it is high pitched, even shrill; with heavy pressure it is very low and ominous. Pitch differentiation is not easy to control on the large coil spring. It seems that the bow does not immediately set its larger mass into vibration. It takes a few mo-



THE SPRINGBOARD

At the top is the large coil spring described in the text. The thin metal can lid is at the right end of the 2x6 board. The overhanging wood strips are toward the left, and the grill can be seen beneath. The large can with another spring attached and mounted microphone is beneath. Yet another spring can be seen to the left running from the grill to the aluminum leg. The combs attached to the board are not visible.

Photo by Eric Leonardson.

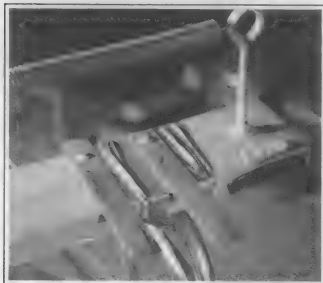
Eric
Leonardson
at the
Springboard

Photo by
Arlene Walters



Close-up
of the
Springboard
showing the
Daxophone-
like wooden
sticks

Photo by
Eric Leonardson



ments of bowing to get it going. Once it does, it likes to go its own way so to speak. Bowing the smaller side springs produces smoother and somewhat more controllable tones — like a growling cello. The wood sticks, when bowed, produce a nice variety of sounds: sometimes like “animal speech” or a phlegmatic snore. When I pluck them they produce a deep, dry but resonant thump. The grill sounds gamelan-like when plucked; when bowed it tends to screech. The thin metal can lid offers modulating pitches when I bow around its rim. In inspired (or desperate) moments I also play the Springboard with a music box mechanism, chains, power tools, my shoes, even my bearded chin. And, needless to say, the reverb is built-in.

Eric Leonardson can be reached by e-mail at eleon@tezcat.com, or by post at 1550 N. Milwaukee Ave., Chicago, IL 60622-2008. Also, there's a homepage on the web for his experimental music trio Wormwood. The URL is <http://www.soundweb.com/home/Wormwood>.

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WOODCUTS FROM AN OBSCURE 19th CENTURY ACOUSTICS TEXT

Professor Pietro Blaserna's *The Theory of Sound in its Relation to Music*

With notes by Bart Hopkin

In early scientific texts, you can often find pictures of mechanical devices for demonstrating scientific phenomena. In books on acoustics, for instance, you may see illustrations of contrivances for scribing soundwave motion on smoked glass, or for visually demonstrating standing wave motion patterns within an organ pipe. Some of these pre-electronic, pre-computer devices are wonderfully ingenious. It's always fun to study them, because in them (unlike in computer chips) you can see the workings of the machine, and observe visually how it does what it does. In addition, the woodcut renderings are often beautifully done — real draftsmanly works of art.

We have featured this sort of illustration in *Experimental Musical Instruments* several times before. (See, for instance, the "Notes from Here and There" section of *EMI* Volume 11 #2, Dec. 1995, for engravings taken from J.A. Zahm's *Sound and Music*, McClurg & Co., Chicago, 1892.) A few months ago Craig Tucker, a New Mexico violin maker, noted our interest and thought to send us his copy of the 1875 treatise *The Theory of Sound in its Relation to Music*. The book was authored by Professor Pietro Blaserna of the Royal University of Rome and published by Kegan Paul, Trench & Co. in London (3rd edition published 1883). I have been unable to learn anything about Pietro Blaserna beyond the fact that he authored this book. But the book is full of fine examples of just the sort of illustration I've been discussing.

No artist is credited for the woodcuts in the Blaserna book, except that there is a note at the beginning saying "A few of the woodcuts in this work were designed by Professor Tyndall for his book on Sound. They are reproduced by his kind permission." As for the others, perhaps they are the work the author. Or is it more likely that they come from a nameless engraver in the employ of the publisher?

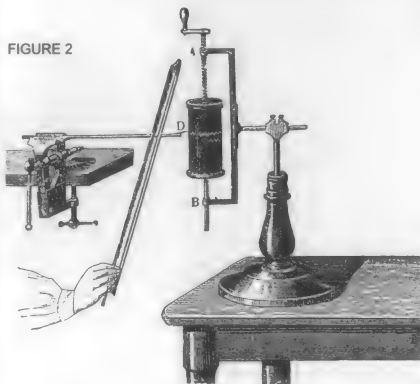
The opening chapters of Blaserna deal with basic theory of sound. It's here that we find a wealth of woodcuts, illustrating various mechanical apparatus for demonstrating the vibrational phenomena he discusses. Later chapters venture more into music theory, and eventually into the history of European music up to the author's time, concluding with a nod to the unknown future.

I have chosen several of the most elegant woodcuts to reproduce in this article. They are accompanied by captions describing the purpose and workings of each. Several wonderful drawings of siren-like devices aren't included here, because I'm saving them for an article on sirens that I hope to have ready for publication in *EMI* at a later date.

FIGURE 1



FIGURE 2



FIGURES 1 AND 2: Two methods for scribing vibrational movement in a tuning fork prong or other vibrating prong, in effect graphing displacement against time. In Figure 1 a plate of glass, "coated with lamp-black by a petroleum flame," is drawn alongside a tuning fork with a point attached to one prong. Figure 2 shows a slightly more sophisticated device, in which a cylinder coated with blackened paper is mounted on a screw handle. This allows the cylinder to gradually descend as it turns, yielding a longer trace that spirals the cylinder.

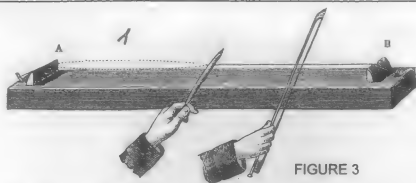


FIGURE 3

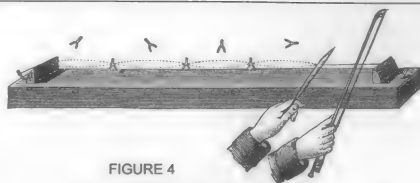


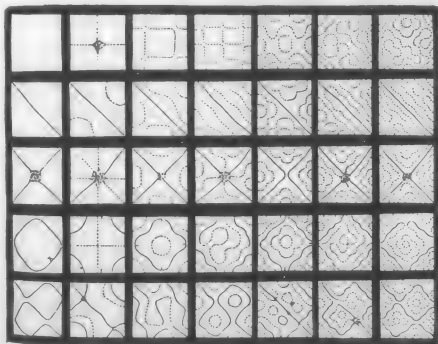
FIGURE 4

FIGURES 3 AND 4: A monochord, demonstrating how a string vibrates in fractional segments for the production of overtones. The left-hand object in figure 3 (is it supposed to be a feather?) is lightly stopping the string at its midpoint, forcing a node there and causing the string to vibrate primarily in its second mode, sounding the second harmonic an octave above the fundamental. In Figure 4 the maybe-feather is at the one-fifth point, eliciting the fifth mode. The little inverted Y-shaped things represent bits of folded paper, placed on the string prior to bowing. The idea is that they dance about and fly off when placed on the active parts of the string but remain quiet at the nodes, in this way showing the nodal locations.

FIGURE 5

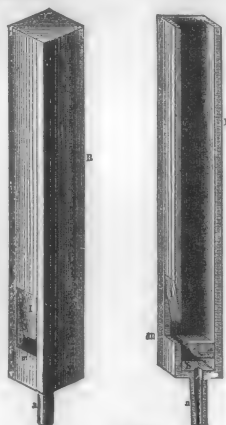


FIGURE 6



FIGURES 5 AND 6: Chladni patterns. Toward the end of the 18th century, the German physicist Ernst Chladni performed a series of experiments in which he bowed the edges of metal plates upon which he had sprinkled fine sand. The sand would dance about on the vibrationally active parts of the plate, eventually gathering and coming to rest at the vibrationally inactive areas. The resulting sand figurations could then be seen as graphic indications of the plates' vibrational patterns. Different bowing techniques and locations would bring out different modes of vibration in the plates, yielding different patterns in the sand. Figure 5 shows a set of 5 Chladni plates with central supports. Figure 6 shows some of the wonderful variety of patterns attainable.

FIGURE 7



FIGURES 7 & 8: Illustrations of two basic types of organ pipe. Figure 7 is a flue pipe, shown as it actually appears and in cut-away view to show the insides. Figure 8 shows the base of a reed pipe, in a cutaway view showing the mounted reed, and a detail of the reed itself.

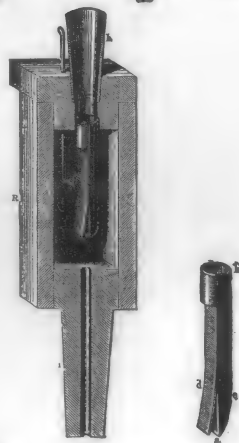


FIGURE 8

FIGURE 9

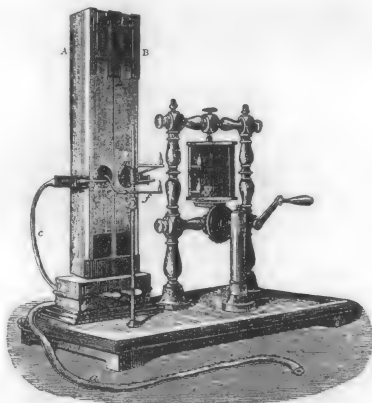
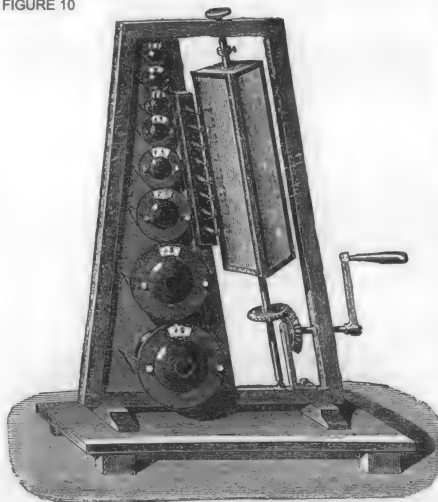


FIGURE 10



FIGURES 9 AND 10: Two manometric devices credited to the 19th century German physicist Karl Rudolf König for demonstrating and analyzing wave motion in air. The term "manometric" refers to devices which measure pressure in gasses (such as air); König is noted for having developed the "manometric capsules," or "flame manometers," shown here.

Figure 9 shows a system involving an organ pipe with a hole drilled in one side at the center. (This drawing shows a version of the apparatus with two pipes). Covering the hole is a disk-shaped capsule. The side of the capsule that faces into the pipe is made of a flexible rubber membrane. Near the pipe is a gas flame. A tube from the gas supply leads into the capsule, and another tube leads out of the capsule and to the burner. If the air in the column is still, the gas simply passes through the capsule and on to the burner, producing a steady flame. But if the air in the tube is undergoing pressure fluctuations, as with vibration, then the capsule's adjacent membrane will flex with the vibration, causing a pumping action in the capsule. The flame then rises and falls in correspondence with the standing wave in the pipe. This movement of the flame would not normally be observable, because its frequency is indistinguishably fast. But König set up a special viewing system which takes the recurring pattern of the flame's movement and spreads it out visually into an observable oscillatory pattern. Near the flame is a rapidly rotating square block or pillar. (It is labeled *s* in Figure 10, but it's a little difficult to make sense of it visually. The same component is easier to interpret in Figure 11.) Each face of the pillar has a mirror on it. Looking at the reflection of the flame in the mirrored pillar, you see a series of images traversing each mirror face in rapid succession as the pillar rotates. In the observer's eye, the series fuses together to form

the observable pattern of high and low flames in the image. That image serves as the representation of the oscillation pattern of the air in the organ pipe. The effect works best in a darkened room.

Figure 10 shows another apparatus employing the same manometric idea, now serving as a harmonic analyzer. This one involves a series of tuned Helmholtz resonators — that is, globular chambers tuned to resonate specific pitches. (The tuning is a function of the size of the chamber and the size of its opening.) In Blaserna's description there are eight resonators tuned to a harmonic series over a fundamental pitch of *c*. Each resonator has its own attached manometric capsule connected to its own flame. A single rotating mirror pillar serves for viewing all eight flames. If a sound source producing the note *c* is brought near to the set of resonators, then the air in the corresponding resonators will be set into motion for whichever of the eight harmonics are present in the tone. Through the pumping action of the capsules, the selected resonances will be reflected in the flames. The observer will (within the limits of the apparatus) be able to assess the harmonic content of the tone.

Much as I enjoy the ingenuity of this device, I should point out that we've already seen something similar but simpler and more practical in *EMI*. In Volume VII #6 we ran an article reprinted from the June 1922 edition of *Science and Invention* magazine entitled "Building a Color Organ: The Harmonicophone Shows Notes and Harmonics Sounded." The apparatus featured there, like the König instrument just described, was a crude harmonic analyzer using tuned Helmholtz resonators. But in place of the capsules, glass flames and special viewing system, it used a simple but sensitive pivoting mechanism at the mouths of the resonators to signal the presence of any resonance response.

FIGURE 11



FIGURE 11: A method for demonstrating vibrational activity in a wind instrument air column. The drawing shows an organ pipe with one wall of glass. The hand is holding a string attached to a thin paper membrane, suspended horizontally. Sand is sprinkled on the paper. Movement of the air in the pipe causes the paper to move, making the sand jump around. By hanging the membrane at different points in the pipe you can observe where the air movement is greatest. Most conspicuously, you can demonstrate that there is a point near the center of the pipe where there is no movement. This is the central displacement node for the pipe's fundamental mode of vibration.

FIGURE 12

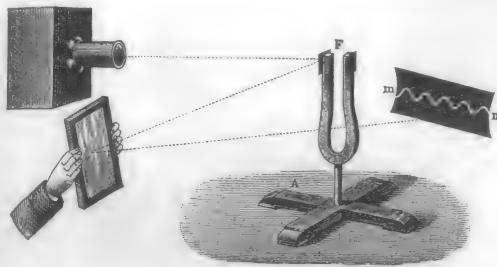
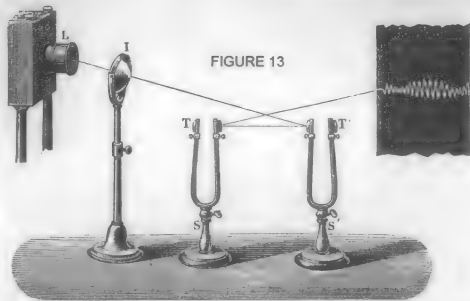


FIGURE 13



FIGURES 12 AND 13: Another method for making vibratory motion visually observable. In Figure 12, a ray of light is directed onto a small mirror attached to a tuning fork. From there it reflects to a hand-held concave mirror, and from the mirror to a surface where the resulting spot of light can be seen. If the holder turns the concave mirror while the fork vibrates, then the spot of light traces a curve that is a visual representation of the fork's movement.

Figure 13 is an elaboration on the idea. Here the light reflects from the mirror on one fork to another mirror on another fork, and from there to the surface where it can be observed. If the second fork is made to turn, it produces the moving trace. This two-fork system allows you to observe the waveforms that result from two vibratory movements added together. The trace shown in the picture, for instance, illustrates "beating" — the rise and fall in amplitude that results when two close but not identical frequencies are combined.



FIGURE 14

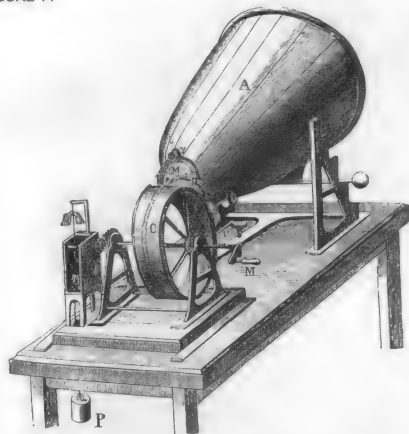
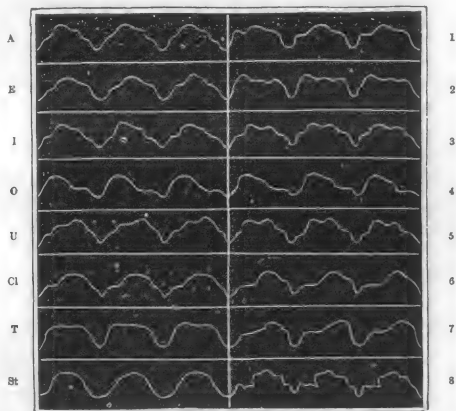


FIGURE 15



FIGURES 14 AND 15: Scott's phonautograph. This is a more versatile device for tracing vibratory motion. It's not limited to specific sound sources; it can give you a trace for whatever sound you wish. The main body of the instrument is a parabolic horn, open at the large end, for the purpose of focusing sound energy from a sound source located in front of the opening. At the narrow end is a flexible membrane (marked M in the drawing). Attached to the membrane is a pointed stylus for scribing. The body of the stylus has a right angle shape, with one leg attached flush against the membrane. It pivots with the membrane as the membrane moves in response to sound waves gathered in by the horn. The movement at the point is traced on smoked paper wrapped around the rotating drum marked C. Figure 15 shows a sampling of traces from the phonautograph. The first five were taken from a baritone voice singing the vowels A, E, I, O and U. The sixth and seventh represent trumpet and "clarinet" sounding the same pitch as the voice. The eighth shows traces for a string bowed at two different points along its length (left and right halves of the trace). The string trace was not made with the phonautograph, but with a related device not described in Blaserna's text.

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THE
HARMONIC
WINDOW

Edited By G. R. CHAZAR and [illegible]

Starlight on a clear night, on a moonless night, laces forest trails through phantom trees that usher the traveler by, guarding deep wells of blackness that room just beyond. Certain sounds can be used as a beacon, is not a compass, and it was by Lake Superior's breathing that I held close to north... listening as it grew nearer, holding its breath, sighing, hiding in the darkness behind the abrupt edge of the woods. A chance code of stars advanced overhead, flashing ancient messages down through the leaves, telling night stories to next day's mushrooms and tempting them up from the ground.

Upon a bed of polished agate at the bottom of the lake slept Nebunabaiq, Adjibwa lake spirit, her hair drifting languidly up above her head, like cobras charmed by the currents of the sea. Through the trees, do I hear her waking? Should I cautiously stop to listen? Or is that the Parkwoodjinnies behind me, the wood spirits, and dare I tempt them any longer? I kept on in this forest sequined at night with spider eyes, caught in the remembered light of the lantern I hadn't brought. Brilliant, like lost stars fallen amidst the trees.

My destination on this unexpectedly warm, late September night was a blueberry patch atop a low bluff that ran all along the curving shore...

THE HARMONIC WINDOW

by Q. R. Ghazala

(continued from previous page)

Lake Superior shone up ahead, shifting pillars of iridescent gray between the pale blue birch trunks filing past. This woodland of Hiawatha has a soul of its own, and is known to lie serene while relentless lake winds tear at its soft edges, rolling down the tree line, transforming the forest into a single rippling organism. But strangely, there was no wind at all when I stepped out beyond the Pukwudjinnee galleries, into that soft light shed by the distant burning suns of nighttime's delicate shadow world.

When I sit amidst blueberries at night to watch the northern lights above Lake Superior's mysterious waters, invisible along her remote shores, there is always the chance of startling a meandering bear intent upon the same patch of fruit. This thought crossed my mind as I settled into the low, purple-black bushes on that oddly still evening, though I was the one that this night held surprise for.

A firefly, borne upon some renegade current, and as off-course and alone as that breeze was now distant, drifted down from high amongst the stars I was watching in an attempt to answer my lit match. Then back up to the "summer triangle" he swept, pausing to flash a cold chemical strobe, disappearing again far above on the way to Vega, Deneb, and Altair.

From east to west, over the false-flat horizon of the lake, rose a brilliant arch, a waving curtain of electro-magnetic fluorescence in cerise greens and pinks. Polaris glittered through the aurora, nestled in its slowly disassembling stellar fields. Brighter still, the northern lights grew into a vast ghostly curtain driven by mad solar winds, and shone down upon the lake's braided waves, exalting their curls into phosphorescent eels clenched head-to-tail, wrestling for the shore and sinking, luminous, into the stones. This evening's planet was electric, wild, and alive, filled with timeless spirits and ageless magic, still ringing with the stroke of creation.

I suddenly sensed something was wrong above me, with the sky... something was wrong. The Pukwudjinees had come to the edge of the forest to peer up past the night-silvered leaves. Nebunabaig was now floating just beneath the lake's glassy surface while inside her cold eye the disturbed heavens swam,

peculiar then as they were. Above me, on this still, clear, crystalline night, the stars were blotting out.

Five or six round silhouettes were slipping overhead, obscuring the stars, the Milky Way, blacker than the stellar lampblack of distant space. Featureless, without depth, silent, their size and closeness were impossible to tell. Then, in rapid sequence, three sonic booms clapped the air, the last one a deafening concussion just overhead. The leaves jumped at this blast, shaking off into

the thin air a startled mist that blurred the woodland's canopy. A high-pitched roar, if there can be such a thing, followed this last implosion, a sheet of sound that held fast in the atmosphere. I saw the disc twice strike the water, like a perfect skipping-stone, before hurtling across the sand and lodging against the rise of crumbling earth that joins trees and beach. Dry rivulets of quartz soil hissed down the shaken slope, and all was cave-silent again.

Glistening, jet black, dissolving into shadow, like a wet beach stone the saucer lay before me under the waving northern lights. Sharp reflections of glittering stars swept over its rounded edges and slowly climbed up its back as I approached. In this spectral light of corona discharge and galactic glow I stood before the ship... a black-lacquered mushroom cap, sixty feet wide, upon it a glossy picture of the heavens. Suddenly there was coldness, and loudness, and I was inside.

The winds that beat back the Lake Superior shoreline, that take down the ships and shape land's end, the boiling

atmosphere of Gitchee Gumee so absent that night was here. Inside this craft the gales howled as they swirled past the handholds and whistled through the ship's low archways. But the instruments are what fascinated me, the apparatus, the configurations. Reaching through the spinning air, I dipped a fingertip into a rippling command pool, a small well of instructive liquid metal, and in that exhilarating instant flooded with a fantastic realization: *I was familiar with the controls.*

I'd like to tell you more about that strange craft, and how Nebunabaig's face shone in the water as the gibbous moon rose



"The Pukwudjinees had come to the edge of the forest to peer up through the night-silvered leaves."

from the sea while I sailed up, up above her, higher, higher, ...into the stars where the firefly flew. It is the sensation of alien-as-familiar, however, that brings these words together, and why, amidst the saucer's peculiar instrumentation, the Harmonic Window device appeared. Because there it was, without a change, surrounded by glowing touch-zones, 3-D holocharts, and glimmering sonastar chambers.

There are worlds within worlds. How less tangible is the reality of a dream than are the happenings of the waking world? Even persons known for great self-control may cry aloud from the dream world, so engaging in this realm. I suspect the dreamworld is not a single world at all, but rather that a matrix of many worlds are entered in this Land of Nod. Dreaming settings, then, may differ in significance, and how insightful might be the clues...

When I first saw the Harmonic Window, in the open-eye dreamworld that interrupts sleep, it was disguised as a small teddy bear. It lay camouflaged between other similar bears in the buzzing fluorescent light of a fading discount store. I squeezed this bear, as I did his friends, and felt a promising lump inside. Under the tail I discovered an opening inside which rested a small plastic box containing exactly what I was hoping to find. I checked each cute, fuzzy, smiling animal in this way, and could hide my enthusiasm no better than the gathered on-lookers could hide their horror. I admit: I often explore inside the bodies of soft animal toys. It always raises suspicion. But then, people have searched for art in stranger places. Haven't they?

Nearly ten years ago, when I frisked the teddy bears, portable digital samplers were still something of a rarity. Inside these once-expensive toys, now reduced to only a few dollars apiece, hid just such things... viable samplers with four-second memories. The bear's paws had caught my attention: On the right was printed 'Record', and on the left, 'Play'. No other controls were provided, not even a power switch since the 'Record' paw took care of this as well. I bought them all, though I did not tear them from the fingers of crying babes as my circuit-bending partners accuse.

Is it more difficult to look at the Harmonic Window instrument and imagine it as a teddy bear, or, from a technical standpoint, to now find forty controls where there were originally only two? But this is what circuit-bending does. The process can explode electronic performance potentials to a degree beyond belief. And again, as I always enjoy noting, anybody can circuit-bend since it requires no special tools or experience, and no knowledge whatsoever of electronic theory.*

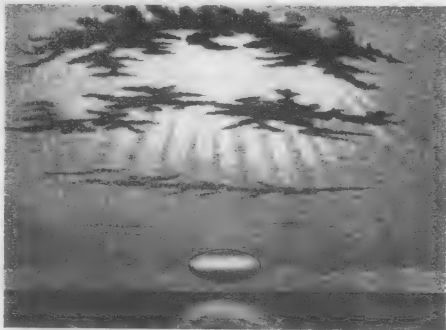
At one time, telephone answering machines used small spools of open-reel tape. The Harmonic Window's case is a re-fitted "Ansa-Phone," whose chrome, semi-circular sliding doors no longer expose remaining tape length, but rather reveal the anti-theory nervous system of a prepared teddy bear. I've only seen one other Ansa-Phone in my life and, oddly enough, it was also associated with a bear. I had gone to an old farm and estate auction in order to photograph the startling image of a gigantic abandoned pipe organ. Immense bellows sets, wind chests, keyboards, carved housings, and several ranks of heavy wooden pipes left exposed to the elements for several years, warping and decaying

on a flatbed trailer in the humid open air. Not far away, rusting in the same stubby field lay the Ansa-Phone. I was crouching over it when the baby black bear shoved its nose into my hand. Pursued closely by its caretaker, the rescued cub then bounded off through the farmyard's disarray of old machinery, crated hardware, and slowly peeling outbuildings faded by the sun.

Every time the 'Record' paw of the original teddy bear circuit was pressed, the prior recording would be deleted whether or not the available sample time had been filled. One of my first discoveries during the bending process was a way to get around this, a way to stack brief samples end-to-end in filling the memory. Shorting two points on the circuit board to each other allowed a sound to be recorded for as long as the points were connected, with each repetition adding to the audio stack.

A push-button on the instrument's console now handles this function.

Also quickly found were body-contact points, spots on the circuit board that when touched with the fingers would send electricity through the player's flesh and blood. The audio effects produced by this musician-as-circuitry wiring sound similar to phasing and disintegration techniques, varied in intensity relative to the pressure of the player's touch. These circuit points have been extended to the gold metal spheres at the top of the Harmonic Window's housing. While I've used standard drawer pulls for these, it's easy to imagine the body-contact concept developed into a strictly body-contact instrument. A sculpture consisting of many separate conductive elements could be created in this way, and played by



"I saw the disc strike twice the water, like a perfect skipping stone..."



"Dry rivulets of quartz soil hissed down the shaken slope, and all was cave-silent again."

*Circuit-bending refers to the process of creative short-circuiting by which standard audio electronics are radically modified to produce unique experimental instruments. A further description of these techniques can be read in EMI Volume VIII #1, 1992.

touching combinations of these forms.

Other additions include a line output, speaker switch, external microphone input and input switch, both one-shot and looping 'Play' switches, volume control, body-contact switch, power and cycle LEDs with Pilots switch, external power input, and remote Stack/Play control.

More important than all of these new features, though, are the Picture and Pattern controls. These twenty-two switches are the basis of the Harmonic Window's individuality. As it often is with circuit-bending, a single, very sensitive point may be found within the circuitry that when connected to various other circuit points produces a great variety of unusual audio behavior. The six Picture and sixteen Pattern switches are extensions of two of these points.

When the first Picture switch is turned on, a connection is made between the Picture point on the circuit and another spot on the board that modulates the Picture point in an interesting way. Picture switch two does likewise, causing a different creative short-circuit to be formed involving the same Picture point. The sixteen Pattern switches operate in the same way, each pair (toggle and momentary push-button) of the eight connecting an additional circuit area to another single, sensitive point. (More on the separate Picture and Pattern effect groups in a moment). All switches operate in conjunction with each other as well, producing even more audio effects. If I'm recalling my lessons correctly, the number of possible switching combinations is what is known in mathematical terms as *a lot*.

What does it sound like? How does it behave? How is it played?

The Harmonic Window can produce music in various ways. My usual approach is to first create a stack of short samples. Very minute samples can be recorded, as quick in duration as a tap on the Stack button. In this way, a wonderfully complex course of streaming samples can be constructed, itself an engrossing sound-form. This sequence can then be triggered, looped, body-contact modified with the player conducting electricity and becoming an active part of the wiring, or, deeper still, set within the Picture/Pattern landscape of severe circuit-bending.

Imagine listening to musical instrument voices containing complex overtone structures—bells, reeds, organ pipes—but listening to them with their fundamentals nearly missing and attack transients strangely altered. Such seems to be the function of the Picture switch set. Then assign to these new voice structures odd rhythmic divisions based upon unevenly changing sets of quarter-notes. This is the main effect of the Pattern switch set, along with additional unpredictable harmonic emphasis. These switch sets are both applied to the sample stack, in possession of its own assembly rhythm, and in this way a 'Patterned Picture' can be created and heard/seen through this opened 'harmonic window.'

Playing the instrument could then involve a progressive and ever-widening restructure process being applied to the sounds in memory. To do this, the sample stack would probably be set to loop, thereby rhythmically repeating the length of its cycle over and over again. On an inspiring beat, the player might throw Picture switch one, the mildest of the set, thereby beginning to transform the stack through harmonic modification. Following the stack's rhythm, additional Picture switches could be triggered on cue, further reshaping the sample's sounds. By this point the loop's many frequencies have been harmonically reorganized, perhaps beyond recognition, though the rhythm of the loop's cycle is still intact. Cautiously introducing, disguised within the rhythm, the pressing of Pattern switches will then begin to transform the pulse of the entire repetition. Ends and beginnings become lost,

new accents arise, structures evolve and dissolve away as new switching combinations are applied. With both hands on the Picture and Pattern switches an amazing degree of real-time control can be had over the sample stack allowing modifications to instantly transport the original sounds to any amount of restructuring, from subtle alteration to complete metamorphosis.

Since the Harmonic Window's tonal renderings can be so extreme, I tend to plant relatively simple acoustic sounds in the instrument's digital memory. Even so, the Harmonic Window can take as tame a stack as—hand clap, shout, bell strike, piano note, a spoken word, door closing—and transform it into an ultra-wide-frequency ensemble piece...bass lines appear, crisp mid-sections leap in and out, highs rush through the structures like wind whistling through the eaves.

No, I can't explain why these things happen as they do. From a technical viewpoint circuit-bending is clearly illogical (therefore my term *clear illogic*, the idealistic counterpart of fuzzy logic, each system grappling in its own way with their common denominator: chaos) and is an inevitable extrapolation of anti-theory electronics. However, contrary to the idea of a short-circuit representing sure disaster, and while I'm certainly unable to accurately describe the myriad of incomprehensible interactions present in the severely altered circuit, circuit-bending *can* be depended on to outrageously increase an audio instrument's performance capabilities.

Persons familiar with the art of circuit-bending, or the ramblings of my articles in *EMI*, will recognize the term *living instrument*. New electronic pressures often exist within the now-modified circuit. In this way, circuit-bending can expedite the normal electronic aging process. As voltage thresholds are exceeded here and there, certain components begin to deteriorate. Over time, then, the instrument's voice changes...just like yours and mine. Is the cup half-empty or half-full? Such devices are what I prefer to call living instruments.

I bring this concept up not because the Harmonic Window is a living instrument itself, but because it is the first instrument I've covered in *EMI* that produces living sound-forms. That is, a sound-form that ages, under the player's fingertips and within the listener's ears, as it is modified with certain of the instrument's controls. Once these over-voltage pressures have been exerted upon the digital memory, rearranging its complex codes, the younger sound-form is lost and cannot be retrieved. It has aged. While I've found much new life within circuit-bending's cornucopia, I've yet to discover a fountain of youth.

I wonder if you've kicked through the weeds of an overgrown junkyard, and stopped, with a handful of blackberries, to marvel at time's work upon the colors of decades-old cars, disintegrating in a patchwork spectrum of exquisite pastels. Or studied the crumbling shapes and textures of bygone structures, with lines perhaps more pleasing in ruin than in architectural prime. The scythe is also a chisel, sharpened by time, and while it is said to be a cruel sculptor its beauty takes but little searching to find. In this way I recognize the aging voice of the living instrument, or living sound-form, and find the emotional messages quite refined.

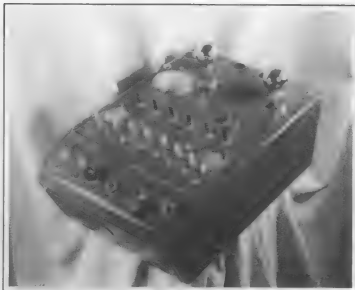
Not long ago, I was asked by an *EMI* reader a question that has surfaced many times before: is the circuit-bent instrument undergoing a seizure? Is the gibberish of an Incantor, the aleatoric music of the Trigon Incantor, or the rhythmic throes of the Harmonic Window a *petit* of electronics? A *grand ma*? The circuit-bent instrument is certainly seized by the realities of its new wiring, and in the true sense of the word is in a state of seizure

whenever any of the circuit-bending controls are applied. But then, isn't the instrument seized by its own pre-circuit-bent design principles in the same way as well?

Yes, a seizure is at work...but is the circuit-bent instrument *convulsing*? Is musical meter a convulsion? Is rhythm an epilepsy of sound? Definitions blur with such comparisons, and these musings might even lead to the notion of creativity as abnormal, therefore suspect as claimed by hierarchies of history, art-as-pathogen the smoke-screen goes. Yes again, circuit-bent instruments are subject to paroxysm, still, circuit-bending is not what I am able to consider a disease state as one would usually ascribe to convulsions. Additionally, convulsions as associated with bodily seizure tend to present as coarse movements that oscillate within a somewhat fixed framework of motion, the result of the contraction and relaxation of specific muscle groups. In comparison, the eccentric behavior of the circuit-bent instrument is not only highly articulate, but also involves vast fields of variation.

The strongest common thread I can find here is the notion of what is *involuntary*. Bodily seizure, convulsion, paroxysm, all are involuntary. But so, perhaps, are the thoughts, images, and emotions one experiences while asleep. My feeling is that just as slumber allows us to slip from one reality to another, circuit-bending implements a similar passageway for electronics...

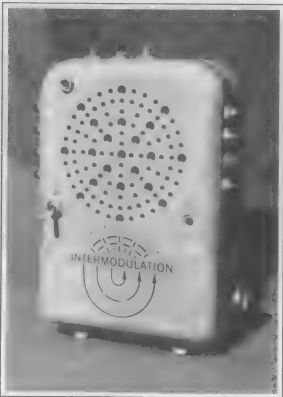
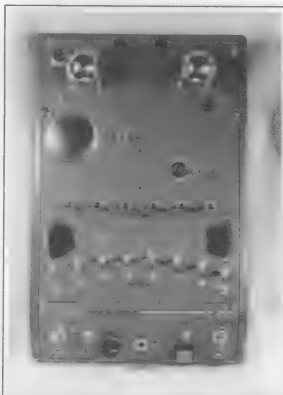
I may have been six or seven years old. It was a warm night, mid-summer, and I had gone to sleep with the bedroom window open. A breeze from the shadowy woods behind the house flowed through the screen in the window, billowing the curtains in the moonlight of blue that only children can see. I dreamt of a king's court, a great corridor of majestic trees, and choirs of voices raised in songs of tongues unfamiliar to me. Yet just as I knew the controls of that ebony saucer on Lake Superior's midnight shore, I knew these words, these lines, these choruses, and wholly enraptured I sang along. In these strange worlds of slumber I had drifted beyond the well-charted Sea of Sleep, for I was singing out loud, unencumbered by unconsciousness, in foreign syllables somehow natural to me. This chorale was resplendent with glorious harmony, and singing along with it, adding to its complex structures, feeling the sweet tonal interplay in my head as I sang, remains one of the greatest



Above: The Harmonic Window

Below: A close-up of the Harmonic Window's control array.

Far Below: A pocket-sized version of the Harmonic Window.



joys in my experience of music.

Of course it's odd, very odd, for a young schoolboy to be singing in a foreign language while blissfully asleep. As you might imagine, in a family household such a recital can last only so long. I remember next my mother standing in the doorway as I awoke, my voice and awareness still half-caught in another world. I was embarrassed as she asked if I was all right, and told me I had been making the strangest sounds she had ever heard. But beyond my embarrassment, I was still flooded with the rapport of that hidden but nearby place of mind.

Complex is the dreamworld beyond flights of fancy, where walking and speaking and singing reside. It is parallels of this kind that I most clearly see in the instruments I've designed. So I would like to reassure that reader who ponders the behavioral traits we've discussed, that no, I don't think the circuit-bent instrument is convulsing, though the question is certain to arise. Instead, I've increasingly come to believe that circuit-bending somehow frees an instrument to dream, to experience electro-thoughts far beyond its normal realities, to sing songs and weave stories of newly found lands.

All things considered...conductive body-contacts, stacked micro-samples, living sound-forms, and the incomprehensible interactions of electronic Pictures and Patterns... it would be easy to conclude that the Harmonic Window's appearance in an alien dreamship was inspired solely by its extrinsic demeanor. But, as we've seen, there are many worlds that coexist within the common moment, and the fabric of time does cast shadows, even folds upon itself now and then. Hence how splendid is the thought that the instruments of dreams want to happen, and perhaps even tell us of times that were precious to them.

Composite engravings in this article constructed by Q.R. Ghazala. Based upon works by H. Winkles from *The Complete Encyclopedia of Illustration*, by J.G. Heck, Park Lane, NY, 1979.

Reed Ghazala can be reached at SOUND THEATER, ECHO 241, 7672 Montgomery Rd., Cincinnati, OH 45236

Website: <http://www.iac.net/80/-cage/reed.html>

Announcing the opening of *The Anti-Theory Workshop*. See the notices section for more.

BOOK REVIEWS

By Bart Hopkin

**EVA RUDY JANSEN: SINGING BOWLS: A PRACTICAL HANDBOOK OF INSTRUCTION AND USE**

Published in 1990 by Binkley Kok Publications, Diever, Holland, distributed in the USA by Samuel Weiser Inc., Box 612, York Beach ME 03910. Paperback; 96 pages.

I do not know where this bowl came from, when it was made, by whom or why. After much study and research I still do not know. I do not know whether the maker meant to create these delightful effects when he shaped the bowl, with the hammer blows that are still visible, and when he engraved the decorations and applied the mat black layer of varnish which is now half worn away.

Perhaps he would laugh in bewilderment if he saw what I was doing. Perhaps he would be happy that his work was still being used. Perhaps he would think I was stupid because it is so obvious that I do not understand. But why should I care?

What is important is the sound...

The singing bowls of Eva Rudy Jansen's book are the metal bowls, usually with a brass-like color, which can be sounded by running a thick wooden stick around the rim with light friction. The circular motion elicits a clear tone with a quiet, yet room-filling quality that many people find profoundly affecting. The bowls most often sounded in this way come from Tibet; and even when they may have been made elsewhere, the association with Tibet remains in people's minds.

Playing the bowls has become increasingly popular in the west in recent years, especially with people interested in healing and meditation. Yet I've found it difficult to find objective information on them. No entry appears in any of the standard musical instrument encyclopedias under "singing bowl," nor have I found listings under several other possible terms for the instrument. People who play them often suggest that singing bowls have an ancient history but the details tend to be hazy.

In the hope of learning a bit more, I ordered Eva Jansen's *Singing Bowls: A Practical Handbook of Instruction and Use*. From the book I gleaned that the reason people are hazy on the details is, no one seems really to know the history of the singing bowl. Most notably, there doesn't appear to be much historical or ethnographic evidence in support of the idea that singing bowls were ever actually used in the east in the way they are now being used in the west. Were these bowls ever played by the rim-circling technique in the land of their origin? Were they used for sound at all? People who have looked into this question don't appear to have come up with much reason to believe they were. The singing of the bowls seems to be an entirely contemporary, western phenomenon. Having said that, let me add: I'm not the expert myself, and I'd be curious to hear if anyone has information to the contrary.

All of this is not to say that the bowls themselves are not

authentic in their Himalayan extraction. The bowls that have been most prized for singing are those made in Tibet, apparently by methods no longer practiced. With the Chinese invasion of Tibet and the resulting stream of refugees, a quantity of these bowls found their way into markets in Nepal and elsewhere, making them available to travelers from the west. Bowls of this type are often associated with Tibet's *bon-po* or Bön religion, which combines influences of Lamaism and Mongolian shamanistic practices. In Tibet and other Buddhist countries they are often found in monasteries.

The Tibetan bowls vary widely in size and shape. The claim is that they are made with a blend of seven metals, gold and silver among them.

The rim-circling sounding technique is used in the west with other types of bowls as well. Metal bowls from Nepal, as well as Japan and elsewhere, have been used. Recently some American makers have started producing singing bowls, not all of them of metal, such as the beautiful crystal bowls available through Crystal Distributing Company in Houston, Texas. The bowl shape is a naturally resonant one (a bowl is, after all, nothing but an inverted bell), and almost any bowl of metal or other rigid materials is capable of producing an attractive tone when struck with a suitable mallet or rim-circled. Some bowls do, however, outshine others in producing an beautiful tone.

Eva Jansen, author of *Singing Bowls*, is forthcoming about the historical ambiguity regarding the rim-circling playing technique. At the same time, she is very much aware of the singing bowls' association with ancient eastern spirituality. She treats these associations respectfully and presents them in an attractive light, since the book is really about the spiritual qualities attributed to the bowls. At the heart of Jansen's book, as the opening quote above indicates, is her interest in experience. She emphasizes the sound of the bowls, the look of the bowls, the playing technique, and her belief in their special meditative and healing properties. She discusses such things as the visible standing wave patterns that arise in water-filled bowls as they sound. Objective technical information on the bowls, their origins, their construction and acoustics — these things are not the strength of Jansen's book. It works instead as a focused contemplation of a single artifact and its sound, surprising and enchanting. In addition, one chapter is devoted to two other instruments used in Lama and Bon-po practice: bells (specifically, a small hand-bell with clapper), and the small hand cymbals known as *tingshaw* (also written as *tingsha*; apparently the same as or closely related to instruments appearing in musical instrument encyclopedias as *ting-ting-shag*, *tin-tin-sag* or *tin-sag*).

This discussion leaves an unanswered question. If it's true that the rim-circling technique has no antecedent in the regions from which the bowls themselves came, then when and where did the technique arise? Whose idea was it?

PHILIP DADSON & DON McGLASHAN:
THE FROM SCRATCH WORKBOOK

2nd edition published in 1995 by Heineman, 361 Hanover St., Portsmouth, NH 03801-3192. 102 pages, large format, spiral-bound paperback.

One of the authors of this book, Phil Dadson, is the primary force behind the New Zealand performing group *From Scratch*. Don McGlashan, co-author, also was with *From Scratch* for many years prior to the publication of the book. *From Scratch* uses instruments of their own design in large-scale, highly choreographed and musically potent performances. Most prominent among their instruments are giant, tuned tubular aerophones played by percussion in a rhythmic barrage of great precision and force. The group and its instruments were featured in *EMI's* December 1990 issue (Volume VI #4).

In the same year Phil and Don came out with *The From Scratch Rhythm Workbook*. Now, five years later, a new and revised edition has appeared. The bulk of the book is a set of group rhythm exercises for body movement, vocalizing and simple percussion. The exercises grew out of and are grounded in rhythm workshops for diverse groups of people that have been presented over a period of years by members of *From Scratch*. A typical exercise might call for participants to make an ongoing two-step movement to provide an underlying pulse, while performing call-and-response hand-clapping rhythms. The rules governing the interactions are simple and easily internalized. One senses that any rough edges — any potential difficulties or sources of confusion — have been worn away as the exercises have been refined in use with many groups over the years. One also senses that they'd probably be great fun to participate in: even in their simplicity they seem to have a lot of potential for lively and inventive interaction.

Several appendixes follow the rhythm exercises of the main text. The two most substantial are "Some Instrument Ideas" and "VOM (Variable Occasion Music)." The VOM section presents a set of more sophisticated programs for musical interaction. The members of *From Scratch* used these programs for their own musical development early on. In this book the purpose of the VOM section is to provide additional context to the simpler rhythm exercises given earlier in the book, and also to offer some more challenging material.

The fifteen-page "Instrument Ideas" appendix gives descriptions of several of the instruments that *From Scratch* has used in performance. An important facet of *From Scratch's* instrument-building work has centered around the idea of "percussion stations," in which several instruments are arrayed before each performer. The configurations are suited for fluid performance, and at the same time make an impressive visual display on a grand scale. The instruments of the percussion stations include the big percussion aerophones, as well as tuned-tongue instruments of metal and bamboo, and drums. The appendix also has descriptions of various whirled instruments (bullroarers and hummers), bucket drums, tube drums, glass bells from truncated bottles, and more. Some but not most of the material here parallels material appearing in the *EMI* article on *From Scratch* mentioned earlier.

The overall tone of *The From Scratch Rhythm Workbook* is clear and accessible. The visual design makes it easy to follow, and it's fun, too: lots of whimsical motifs in the margins.

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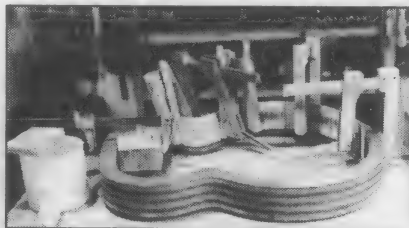


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RECORDINGS REVIEWS

By Warren Burt, Mitchell Clark, and René van Peer

ALEMU AGA: The Harp of King David: *Bägänna* of Ethiopia

Wotse Music Long-Distance 142009. Notes in French and English, with a song text in Amharic with French and English translations

This is a collection of vocal pieces sung and played by Alemu Aga on the Ethiopian ten-string *bägänna* lyre. Most of the pieces are Ethiopian Coptic Orthodox Christian hymns, for use outside of the actual church. In addition there is a long song "on the futility of life" (the only piece for which a text and translations are provided in the notes) and an instrumental piece which concludes the album.

The *bägänna* is the only surviving performance tradition of the large West Asian rectangular lyre. This "box-lyre," with asymmetrical arms supporting the crossbar ("yoke") to which the strings are attached, is played vertically and plucked with the fingers, as opposed to the playing technique of the smaller, symmetrical "bowl-lyre," usually held at an angle and struck with a plectrum. (Note that both traditions are found in Ethiopia, where the bowl-lyre is called *kerar*.) The box-lyre is one of the oldest known stringed musical instruments in the world, examples of it having been unearthed at Ur which are dated to around 2600 BC, and the Ur lyres certainly were, by this early time, highly developed and elaborately decorated. The early diaspora of the box-lyre brought it elsewhere in West Asia as well as into Africa. It is the instrument identified with the ancient Jewish *kinor*, the instrument of King David commonly translated as "harp" — as it is here. Legend has it that the box-lyre was brought to Abyssinia (Ethiopia) by David's grandson, Menelik, although it is now thought that the instrument was actually introduced there, centuries upon centuries ago, via Egypt.

This album affords a glimpse into the sounds of the dawn of known stringed musical instruments, and it is a delight. The tones of the *bägänna* are deep (with a buzzing timbre), and Alemu Aga's singing, itself deep in pitch, is soft yet spirited. These are hymns which truly engage the listener, and despite the language difference they speak directly to the listener — this would seem to be what a hymn is about. There may not seem to be a lot of surface variety from one piece to the next, but upon focusing on the musical landscape, one will find a range of subtle, and refreshing, variety.

The liner notes tell of the plight of the *bägänna* in the later 20th century. During the recent socialist period of Ethiopia's history, the instrument was, due to its aristocratic and religious associations, essentially outlawed — a frightening parallel to the fate of the Chinese *qin* zither (another stringed instrument of venerable antiquity) during China's Cultural Revolution. Alemu Aga is one musician who has bridged the dry period: he had made recordings for UNESCO in 1972 and can now be heard again.

The few defects of the album — such as what appears to be a recording or mixing problem near the beginning of the fourth selection (which may be less noticeable if listened to in mono), and the booklet's very rough English translation of the French notes — are minor. How much the music of the *bägänna* may resemble that of the large box-lyre of ancient West Asia is something we may never know. Nonetheless, this is a beautiful collection of musical sounds that do reach deep into antiquity.

—MC

DEREK BAILEY AND GREG BENDIAN: *BANTER*

CD from O.O. DISCS; 261 Groovers Ave., Black Rock, CT 06605-3452

Readers of *EMI* interested in improvisation will be most impressed

by this new CD from improvisational veteran guitarist Derek Bailey and percussionist Greg Bendian. Playing "normal" electric guitar and percussion, including vibraphone, cymbals and hand drums, they make a wide variety of sound in nine effective, angular duos. Bailey is a master of extracting every timbral nuance out of an instrument in an improvisational context (his book "Improvisation" is a pretty definitive study of the subject), and Bendian matches his rapid pace of change.

For the most part, the improvisations are rapid, complex, and pointillistic. Careful listening reveals moments of thrilling rhythmic complexity. Even the more laid-back moments, such as the end of "Enmeshed," the second track, have a tautness to them. Freely changing roles, Bailey's guitar frequently is used percussively, and Bendian's percussion becomes melodic. In pieces where they match, such as the bowed vibraphone and microtonal string bending of "Crane Grove and Dark," the results are subtle and engrossing. Both players also work with resonance, damping normally resonant sounds to produce very dry, articulated playing, and extending normally dry sounds through amplification or other techniques (i.e. rubbing skin or chains against drum heads). It would be hard to imagine a more timbrally diverse set of improvisations than this.

For the most part, the playing is fairly abstract, though fleeting references seem to exist — an isolated jazz guitar chord voicing here, a bit of an awkward waltz (as at the beginning of "The Chatter Wasn't") there — but they quickly dissolve back into the ongoing stream of continuous variation these two lively minds produce. For those interested in contemporary improvisation that features a rapidly changing array of sometimes delicious timbral complexity, this album will be a treat.

—WB

ROS BANDT: *GLASS AND CLAY*

Move CD 3045, from Move Records, Box 266, Carlton South 3053, Australia.

Melbourne-based composer and instrument builder Ros Bandt has been working with the fragile sounds of glass and clay since 1978. Her *flagong*, a collection of 31 suspended glass objects, was directly inspired by her seeing Harry Partch's Cloud Chamber Bowls. Since then, she has added three clay instruments designed and built by ceramist Judy Lorraine to her instrumentarium: the gamelan bells (fifteen small blackware hollow slit bells); the temple bells (three large blackware coil pots); and the Mesopotamian bowls (five microtonal ceramic dishes).

Working with these delicate materials implies a certain aesthetic, and indeed, the earlier LP release of three of the six tracks on this CD was entitled *Soft and Fragile*. In her liner notes, Ros also makes a connection between the delicacy and transience of her instruments and the transience of the improvisatory processes that generated these works. "Ocean Bells," the oldest of the works here, uses the flagong played along with a tape of it slowed down an octave, to create an intricate meditative soundscape. "Shifts" and "Annapurna" are two pieces performed and devised by LIME, a quartet Ros was part of. In "Alchemy," Ros uses a sampler to slightly modify and mix the sounds of the gamelan and temple bells, while "Gulf Song," using the Mesopotamian bowls and voice, is an elegy for the innocent victims of the Gulf War. "Night on the Indian Ocean," the most recent piece, is a mix of flagong and a recording of the Indian Ocean made in Perth.

The music on this album is elegant and sensual, but not in any sense mindless. Often, body processes, such as breath length, are used to determine the flow of the music, giving it a certain reflective, slowly paced quality. The instruments are all illustrated with color photographs, and both pieces and instruments are described in well-written liner notes. All in all, a wonderfully elegant and extremely listenable production.

—WB

JEAN-CLAUDE CHAPUIS: TRANSPARENCES, VOLUME I

CD from Buda Musique, 188 bd. Voltaire, 75011 Paris France

This is the first of three projected CDs from French composer, instrument-maker and researcher, and performer Jean-Claude Chapuis, who specializes in glass and crystal instruments. The instruments used on this first album are the angelic organ, a set of tuned water glasses played with the fingers, a glass harmonica, and two glass-keyed instruments, the glass balaphone and the cristalophone, a vibraphone with crystal blades. In some of the pieces, a chromatic harp as well is used, its pure timbre blending marvelously with the glass sounds. The music is a mix of striking and original compositions by Chapuis himself, as well as sensitive transcriptions of some pieces from the historical glass repertoire.

The album is gorgeous, and very sweet. The transcriptions, from Mozart, Bach, Faure, Saint-Saens, Martini and Miss Ford (an 18th century English composer, one of the first to seriously write for glass instruments) are lovely, and delicate, showing many aspects of the personality of the instruments; but of greatest interest to *EMI* readers will be the six compositions by Jean-Claude Chapuis himself, which extend the sounds of these instruments into the present. "Nautilus" uses water drops and sustained glass sounds to create shimmering curtains of sound. "Piri Yana" uses the deep percussive sounds of the glass balaphone as well as stroked glass sounds to create a mysterious soundscape. Especially attractive here is the ending on ascending harmonic series pitches. "Luminescence" is based on whole-tone scale patterns, and is practically evanescent — the piece seems to dissolve into mist even as you listen to it. Breathily, air-activated glass sounds are the most striking aspect of "Manaus" — the basic waltz rhythm of the piece is augmented by all sorts of lovely stroked-glass ornamentations. "Boite a Musique" which closes the album, features a lovely use of dissonance in its evocation of the workings of an old music box.

Volume 2 of this series will be devoted to historical pieces from the repertoire for these instruments, while Volume 3 will present the repertoire especially composed for the "Transparences" ensemble, which promises the sounds of "glass-stringed piano, crystal bells and chimes, glass harp, glass 'gamelan', glass cymbals, the 'Euphon', pyrophone, crystal marimbans..." On the basis of the lovely sounds on this Volume, I can't wait.

—WB

WERNER DURAND: SOLO PIECES '84 -'94

On cassette from Werner Durand, Klausenerplatz 11, 14059 Berlin, Germany

THE 13TH TRIBE: PING PONG ANTHOLOGY

On CD from Review Records rere 174cd. Distributed by Recommended No Man's Land, Postfach 110449, D-8700 Würzburg, Germany

The music of the German Werner Durand owes much to his playing of reed instruments and end-blown flutes and his use of the digital delay. Playing as little attack as possible, he achieves an uncommonly smooth and even sound that he feeds to the delay, creating wide undulating plains of chords that enfold discreet melodies growing from them. He may also decide to start each note with a faint puff and have the delay string them into rhythms that can change and syncopate at will by responding to the output with a good sense of timing. These pieces are no less soft and quiet but, moving from left to right and back, they got my body swaying very pleasantly when I listened to them over the headphones.

For the music he plays with The 13th Tribe he devised and built PVC instruments. Some are blown on the end, others are played with lip buzzing, still others have a clarinet mouthpiece attached to the end, but the musicians may also beat the open ends. Often he has a number of these pipes bundled together, reminiscent of pan-pipes. He plays these instruments with Erik Balke. A third member, Silvia Ocougne, hammers and plucks acoustic guitars. Sometimes they are joined by percussionist extraordinaire Pierre Berthet.

As in Durand's solo pieces the music is quiet and repetitive, although closer to the tradition of the Solomon Islands than to the style of Reich or Glass — no chord progressions or counting systems, but definitely cyclic. Percussion and guitar add relief to the soft drones, rhythms are more distinct, there are more possibilities for variation and improvisation. Durand's music radiates warmth and congeniality. Sometimes I wish it had a bit more bite to it, though.

—RvP

FAST FORWARD: SAME SAME

On CD from Experimental Intermedia Foundation XI 108, 224 Centre Street, New York, NY 10013

Fast Forward is best known for his solo work with the resonance of percussion, especially the steel drum. On *Same Same*, sound has shifted to the background. Instead he focuses on social aspects of music. As music is supposed to be a communicative phenomenon, this is back to basics, albeit in a rather more humane sense than when this maxim is used in a political or religious context. The three pieces are all registrations of concerts, which puts them in the social setting where they belong. They are performed by small ensembles.

He starts out by deliberately turning his back on the realization of music as a collective effort. In "Simultaneous Music" six musicians have to play simultaneously but independently from a score that consists of instructions. They have not rehearsed on it together, and are requested "to concentrate on their own musical output rather than to listen to the music in its entirety" and "to avoid listening to the music being produced by the other players and not to rely upon each other for cues or other musical influences."

"The Yin-Yang Merger" is intended as a meeting ground for acoustic and electronic music. And indeed, representatives of both mix and socialize and one would never bother to be able to tell the difference. Interaction is most strikingly present in the last composition, "Feeding Frenzy." Guy Klucsevsek and Ikue Mori provide a sociable musical ambience on accordion and drum machines respectively, whilst Fast Forward is cooking (yes, cutting vegetables and frying and fumbling about with pans) and Per Blomquist waits on the members of the audience. There is laughter. People give voice to feelings of admiration and gratification.

Still, this CD is more than an exploration of social aspects of music. It is a collection of thrilling pieces, regardless whether the sonic events were premeditated or evolved by chance. There is a short passage in "Simultaneous Music" where turntable player David Shea manipulates a record with choral music, making the voices rise and fall. This is mirrored by cello and violin — just a few moments of pure magic. Moments such as these keep occurring throughout the album. It does transcend the limitations of the medium, the fact that as a listener to the CD one does not partake in the performance. This music is about musicians addressing each other and the people in the audience. It seemed to jump straight over the borderline and speak to me directly. There is no interaction of course, but the music does make me feel involved.

—RvP

JIN HI KIM: LIVING TONES

CD #0024 from O.O. Discs, 261 Groovers Ave, Black Rock, CT 06805-3452

Western Music is based on relations between collections of fairly stable tones. The pitch bend, for example, is usually an ornamentation to the melody. Korean art music, on the other hand, is based on the quality of changing timbre of each tone. Pitch bend is central; melody is the

skeleton on which the bends, glides, swoops, etc. are articulated. Korean composer/performer Jin Hi Kim moved to the US in the early 80s, and has earned a reputation as a formidable and imaginative improviser. This album, however, marks the first availability of her equally formidable and impressive compositions, which unite adventurous Korean and American performers. Much music by contemporary Korean composers adopts a Western stance to timbre, downplaying the rich history of the importance of articulation of each tone that exists in traditional Korean art music. This, happily, is not the case with Jin Hi Kim's music. In each of the four pieces on this CD, a full range of Korean and American techniques co-exist, cross fertilizing each other in splendid tracteries of sound.

"Nong Rock" for *komungo* (a six string zither) and string quartet, is a spectacular opening work. Here Jin Hi has the string quartet play a full range of Korean articulations, pitch bends, etc., which she responds to on *komungo*. The result is a gorgeous interplay of cultural and sonic ideas that gives new life to the string quartet. Two more austere works follow, "Tchong" for *daegum* (Korean bamboo flute with a mirliton membrane) and flutes; and "Yeuom" for *kagok* singer and baritone. Each of these pieces is a highly empathic duet between a Korean and an American virtuoso. "Tchong" matches Hong Jong-Jin's active and strident *daegum* with Robert Dick's searching explorations on a full range of Western flutes. Both players maintain their own identities while trading licks, timbres and ideas at a breathtaking pace. "Yeuom," the most refined work on the disk, finds Whang Kyu-Nam and Thomas Buckner in an absolutely ravishing interplay. Whang's part is based on Korean court lyric songs, Buckner's on a setting of an e.e.cummings text. But the central focus of the piece is on the extended settings and stretchings of vowels that both men so adept at. "Piri Quartet," the final piece, is the longest, and the one that, for me, suspended time most effectively. Oboist Joseph Celli is matched with three virtuoso masters of the *piri*, a Korean oboe-like instrument. One of the piri players, Chung Jae-Guk is also Celli's *piri* teacher, so the empathy between the players here is strong. There are bends a-plenty from both oboe and piri players, complex textures to die for, some stunningly beautiful multiphonics from Celli, and two absolutely hair-raising moments when the piri players suddenly converge on a unison very low tone without pitch bend. The oboe, usually considered a fairly strident instrument, sounds almost sweet here in contrast with the more raspy, woody tones of the massed piri. This is a very attractive album of some of the freshest sounding new music I've heard in a while. More cross cultural efforts like this where both sides learn from, and play with, each others' ideas, please!

—WB

GODFRIED-WILLEM RAES AND MONIEK DARGE: LOGOS WORKS

CD XI-117 from Experimental Intermedia Foundation, 224 Center St., New York NY 10013

Gent, Belgium is the home of the Logos Foundation, headed by Godfried-Willem Raes and Moniek Darge. The archtypical do-it-yourself musical institution, Logos has its own self-designed and self-built concert hall (designed in the shape of a tetrahedron so as to be acoustically transparent) where it presents at least 60 new music events a year. In addition, Godfried is well known as a builder of both electronic and acoustic experimental instruments, and both Godfried and Moniek are composers, performers, and improvisers who regularly tour the world. A performance of their *Book of Moves*, where their movements, detected by an ultrasound device built by Godfried, produce a wide variety of musics, is not to be missed. This new CD of their works, from Experimental Intermedia in New York, does not present any of their work with new instruments, but is, nonetheless, a good introduction to their work and ideas. Godfried has always been concerned with making electronic systems that perform themselves, a concern that goes back to his "Bellenorgel," built in the early 1970s, a board full of doorbells, telephone bells, claxons, ringers, etc. activated by a self-regulating series of cast-off telephone relays, to the rather elegant computer-based composing programs and devices he employs nowadays. These allow him to make certain decisions while the computer is performing, making the

music a combination of his improvising controls for the computer's improvising. These programs are well represented on this album. "Shifts," the first track, is a piece for eight voices of sampled percussion where each of the eight voices is in a different tempo, such that one cycle of all the voices lasts exactly 2520 beats. What's most attractive about this piece is the sense of harmonic shifting, as every so often, the percussion samples transpose upwards as a group. Two of the pieces are also outputs of Godfried's fugue-writing program, an interactive program with which he has, quite improbably, breathed new life into that most moribund of musical forms, the fugue. The two pieces couldn't sound more different. "Fuga Memento," for flute and piano, is austere and gentle, it's lines sparsely weaving about each other. "Fuga Otto Nove (New Car Fugue)" exploits an obsession with the meter 9/8, and the whole tone scale (made up of a series of intervals of the ratio 9/8) to produce a jolly, bouncy piece for piano and electronic keyboard.

Moniek Darge's work, on the other hand, has always been concerned with a sense of place, and with a sense of the spiritual energies that occur in specific places. In their frequent travels, she has recorded a wide range of environments. "Man-Mo," at 18 minutes the longest piece on the disc, is a piece for prerecorded environmental sounds (from Gent and Australia's Northern Territory) and percussion, whistles, clarinets and violin. It's a gentle piece, gradually unfolding, with evocative combinations of acoustic instrumental and environmental sounds. Also evocative and extremely effective is the much shorter "ShSh," for environmental sounds and percussion. Here the environmental sounds are insects recorded in Japan, and monks chanting at a Chinese temple, accompanied by large Japanese and small Chinese bowl gongs.

Also included on the CD are two pieces for orchestra realized with sampled instruments: Darge's "AlviCeba," and Raes' "Spring '94." Godfried's piece, a series of endlessly rising musical planes and steps, was written using another of his composing programs, while Moniek's seems more freely put together, revealing a darker, more somber side of her musical personality than I had previously known.

I find this CD to be just plain enjoyable listening, but as a portrait of the current interests of one of Europe's most interesting musical duos, it's also quite valuable. Anyone wishing to find out about the work of Logos should start with this disc.

—WB

HANS REICHEL:

LOWER LURUM — A GUITAR AND DAXOPHONE OPERETTA

On CD from Rastascan Records BRD-016. PO Box 3073, San Leandro, CA 94578-3073

After *Shanghaied on Tor Road* here is another album with Hans Reichel's Daxophones, a collection of mutated rulers that he made. Reichel plays the beautifully shaped objects with bows, altering the pitch with the Dax, a wedge-shaped wooden block that has curved sides. As I said in the review of the earlier CD, the variety of timbres is breathtaking, all the more so because he achieves it without the aid of electronics. The sticks produce a wheezy sound, sometimes throaty, sometimes nasal, sometimes reminiscent of lipbuzzed instruments as if Reichel were blowing a rather hoarse trumpet. Mostly, though, the daxophones have a distinct vocal quality. The voices seem to belong to characters from the zany cartoons of the '40s and '50s. Irritable, conceited, inane, bluffing, bloated — the ingredients that warrant enjoyment.

Reichel has them play out their parts that, due to the resemblance to the human voice, become arias, duets, trios, choruses — all manner of surreal musical conversation. He underpins and punctuates the intercourse with his idiosyncratic guitar picking, which sounds deceptively regular and sane in comparison. This contrast makes the CD as a whole particularly effective. *Lower Lurum* is a daring mixture of the serious and the ludicrous. It is as lighthearted as it is a work of commitment. An operetta such as this cannot easily be staged in a theater, I suppose, but it would undoubtedly make a great score for a cartoon.

—RvP

TIM ROWE, BLAISE SIWULA AND TONINO MIANO:
ROWE - SIWULA - MIANO

On CD from Tim Rowe, 1667 Tenth Ave 2R, Brooklyn, NY 11215; Blaise Siwula, 250 Elizabeth St 1N, New York, NY 10012; or Tonino Miano, 105 W 77th St 3F, New York, NY 10024

Tim Rowe, Blaise Siwula and Tonino Miano play improvised music. They lay out an array of instruments and objects, start off and just see where their fancy will take them. Rowe is in charge of things to be hit or thrown, Siwula mainly plays in the league of winds and Miano is active on keyboards. When I saw them in het Apollohuis last November they made a spatial point of this categorization, as each played in another room.

Strict though this separation may seem, the resulting music was loose and free, and often quite humorous. Crawling around, Rowe scattered

rods and metal whatnot about, collected them again, then threw them again in all directions. Miano left his keyboard, picked up a book, moved to Rowe's room and started to read aloud in a corner. Siwula lay flat on his back with a musical box on his throat; turning the handle he disrupted its discreet and innocent tinkly-ploink with manic growls and yelps. Intrigued, the audience started walking from room to room, giving this concert a unique lively atmosphere.

You won't find such extraordinary happenings on the CD, but it does breathe the same open-mindedness as the concert I attended. Recorded live at La Mama La Galleria, the sound quality is less than perfect. This is easily outbalanced by the sonic exuberance, the sheer energy, the no-holds-barred, the clatter and roar that make the skull a vibrant space, exorcising from it all redundant thought. This is third-degree ear cleaning.

—RVP

NOTICES

EXPERIMENTAL AND ELECTROACOUSTIC RECORDINGS FOR SALE. Many unusual titles, such as Harry Bertio, etc. LPs a specialty. Send for free listing to: SONIC TIGER MUSIC, PO Box 715, Cambridge, MA 02140 USA. [11-4]

New Instruction Video: You too can play the Musical Saw. Everything you need to know. \$29.95. From Charlie Blacklock, 1821 St. Charles St., Alameda, CA 94501. [11-3]

The Pauline Oliveros Foundation enters its second decade with a new 3-year certificate program in Deep Listening, a new catalog, a new Deep Listening recording label, and deep listening expeditions. For a catalog or information contact the Pauline Oliveros Foundation at PO Box 1956, Kingston NY 12401-0900, email Oliverosfd@aol.com; World Wide Web site at <http://www.tmn.com/oh/artswire/www/pof/pof.html>. [11-3]

DIDGERIDOO — Buy direct from Australia and save. I have been asked by several Aboriginal friends of mine to help them sell their products. Each didgeridoo is about 5 ft long and a high quality instrument with traditional aboriginal designs burnt and/or painted on them. You can now purchase them direct from Australia and save. By cutting out the exorbitant fees charged by importers, distributors and middlemen, these authentic didgeridoos are now available for Australian\$199 (US\$155 approx), plus freight. Payment is easy by major credit cards or money order. Trade enquiries welcome. Send enquiries and orders to: Graeme Eastman, Mainz Pty Ltd., 209 Shaftesbury Ave., Bedford, W.A. 6052, Australia; Ph: (+619) 275 6246; Fax: (+619) 275 3874 [11-4]

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BROADCASTASTIC VWCW 640 AM / 105.3 Continental Cable FM: Experimental music radio show. Music & Noise: Fun with Tape Recorders, Record Players, annoying sounds. Please send tapes & mail to: TOMMY / PO Box 7222 / Richmond, VA 23221. [11-1]

WAYLAND HARMAN'S CLACKAMORE — "THE WORLD'S NEWEST PERCUSSIVE MELODY INSTRUMENT." Clackamore \$23.00 ppp, PVC case \$6.00 ppp, instructional video \$20 ppp. PO Box 6444, Boise ID 83707. The Clackamore — a tool for listening to the shape of your mouth. [11-2]

Thoreau's Aeolian Harp music as he heard it at Walden Pond. Tape cassettes of the music from this harp accompanied by songs of the wood and hermit thrushes. Harp reproductions of his own design available in Walnut. Ken Turkington 1-800-692-HARP. [11-2]

The Anti-Theory Workshop is now open! An assortment of Q.R Ghazala's circuit-bent instruments are available including all 3 Incantor models (Wonderful experimental music boxes. Rewired 'Speak & Spell' series of human voice synthesizers with 10oping, body contacts, electric eye, voice bending, envelope LED, fluorescent display, line output, pitch control, and more. \$300), the Trigon Incantor (human voice synth, aleatory music device played



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Musical Instrument Design: Principles for Instrument Making, a new book by Bart Hopkin, editor of *Experimental Musical Instruments*, will be available as of July 1, and you can order advance copies now. The price of \$18.95 includes shipping within the U.S. (for overseas air add 20%). *Musical Instrument Design* presents underlying principles for the design and construction of acoustic musical instrument of all sorts, with a practical, hands-on approach. There is no other book like it; no other book gathers this information under one cover. Just under 200 pages long; large format; fully illustrated. Order from *Experimental Musical Instruments*, PO Box 784, Nicasio, CA 94946, USA, phone (415) 662-2182. [11-4]

The EMI Wall Chart will be available around July 1. It's a beautiful 24" x 36" wall poster, with graphic design by Gwendolyn Jones, covered with practical reference information relating to musical instruments and instrument making. Suitable for workshop, living room or art gallery. The price will be \$12 (shipping free within the U.S.; for overseas air add 20%); order through *Experimental Musical Instruments*. [11-4]

Making Simple Musical Instruments: A Melodious Collection of Strings, Winds, Drums & More — A book by Bart Hopkin, editor of *Experimental Musical Instruments*, published by Lark Books. It is a collection of plans for home-buildable musical instrument, ranging in difficulty from simple to moderate. The book is written for a general, non-specialist audience, and the approach is non-technical. The instruments aren't so very far out: most of them relate to familiar instrument types and are playable as such. Yet even experienced experimenters will find some new ideas here. It's hardbound, with 144 big and very full pages, lots of color, beautiful photos & illustrations; price \$24.95. Order from *Experimental Musical Instruments*, PO Box 784, Nicasio, CA 94946, USA, phone (415) 662-2182. [10-4]

Air Columns and Toneholes: Principles of Wind Instrument Design is a spiral-bound booklet containing the four articles on practical wind instrument acoustics by Bart Hopkin that appeared in EMI in 1992 and 1993. The articles have been much revised and improved, and there are several additional features included. Published by Tai Hei Shakuuchi; available for \$14.00 (no additional postage required) from Tai Hei Shakuuchi, PO Box

294-C, Willits, CA 95490, or from EMI, Box 784, Nicasio, CA 94946. [9-4]

A REMINDER — Unclassified ads here in EMI's notices column are free to subscribers for up to 40 words; 40¢ per word thereafter. For others they are 40¢ per word, 15 word minimum, with a 20% discount on orders of four or more insertions of the same ad.


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EMI BACK ISSUES: Bound volume sets Vol 1 through Vol. 10: \$17 per volume. Each volume set contains all of the issues of one volume year, photocopied and bound under one cover. The photocopies are a step down in quality from the original press runs, but they are readable still. The price includes postage for U.S., Canada & Mexico air, and overseas surface rate. For overseas air add 20%. In California add 7.25% sales tax. Visa and MasterCard accepted. Order from EMI, PO Box 784, Nicasio, CA 94946, or write for a listing of back issues and their contents. Corresponding cassette tapes are available for later volumes; see information below.

CASSETTE TAPES FROM EMI: Each cassette in the EMI cassette series contains music of instruments that appeared in the newsletter during the corresponding volume year, comprising a full measure of odd, provocative, funny and beautiful music. Volumes VI, VIII and 9 and 10 are available (Volumes I - V and VII are now sold out). The price is \$8 per cassette. This includes postage for air delivery in the U.S., Canada and Mexico, or surface delivery overseas. In California add 7.25% sales tax. For overseas air add 20%. Order from EMI, Box 784, Nicasio, CA 94946. Visa and Mastercard accepted.

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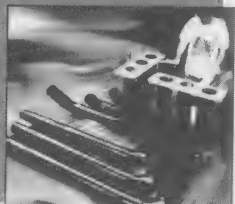


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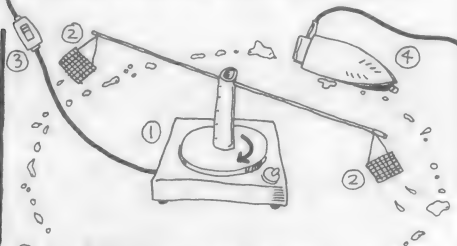
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RAMBLINGS

By Bart Hopkin

Today's topic: movable toneholes.

Quite a few years ago, I reported in *EMI* on a sliding-pitch clarinet I had made, which I called the bentwood chalumeau.* Making a glissando clarinet is a bit of a design challenge, because, for reasons I won't go into here, you cannot make a slide clarinet on the model of either a slide whistle or a slide trombone — or, at least, not without encountering some difficulties. So I was proud of myself for having come up with another continuous pitch system for clarinet that actually works pretty well. Over the years a few serious clarinetists have enjoyed my bentwood chalumeau enough to play it now and then, and a few other makers have liked the design enough to make similar instruments. That's enough to make me declare the idea a big success — albeit, a big success on a very small scale.

You can get more details on the design of the instrument from the earlier article. But here's the basic idea. Normal clarinets have a row of toneholes — openings along the side of the tube which can be covered or uncovered to alter the effective length of the tube which encloses the vibrating air column. In the bentwood chalumeau, the row of holes is replaced by a continuous open slit, about 3/8" wide, running from the far end of the tube to a point near the mouthpiece (see Figure 1). Near the mouthpiece end where the slit begins, a long flexible tongue of wood or other material is attached over the slit. The tongue has an upward curve to it, so that instead of extending along the slit, it curves up and away. When the player presses the tongue downward, it comes down over the slit. The more you press it down, the more of the slit it covers. Running along the sides of the slit are strips of sponge rubber, so that when the tongue comes down, it seals leaklessly over the slit. If I've described it clearly enough, you will recognize that pressing the bent strip down so that it progressively covers more and more of the slit has an effect similar to covering more and more toneholes along the tube of a standard clarinet: it increases the effective tube length, lowering the pitch of the sounding tone. The only difference is that it does so in a slidingly continuous manner, rather than in steps.

This instrument produces wonderful wobbly clarinet sounds. But it is difficult to play with accurate pitch or any sort of rapid, precise articulation. So, in the nine years since writing that first article, I have come up with a couple of alternative designs that allow for more precise articulation while retaining the capability for continuous pitch. The greater control is valuable in most musical applications, but it's a trade-off: what you lose, with the new designs, is some of the goofy wobbliness that characterized

the music of the original bentwood chalumeau, as well as some of the showiness of the peculiar playing technique (a great crowd-pleaser).

Figures 2 and 3 (next page) show the two new designs. Both retain the idea of the longitudinal slit which can be covered to varying extents by an overlying strip. In Figure 2, the original bentwood's bent tongue has been replaced with a strip of flexible material held taut by an anchoring system at the end of the tube. As shown in the drawing, pressing the strip down at any point along its length causes the upper portion of the strip to lie flat over the slit, while the lower portion of the slit remains open. The placement of the finger determines the resulting pitch, by determining how much of the slit is covered.

But there's a difficulty here. While the upper portion of the flexible strip will lie over the slit, it's not likely to lie there firmly enough to actually provide the leakless seal that the wind instrument requires. To get around this, I used magnetism. The instrument tube is made of steel. The flexible strip is a magnetized rubbery material — the same sort of stuff that sometimes used to make slap-on signs for the sides of cars, or family calendars that stick to the refrigerator. (I suspect that this material is made up of magnetic particles embedded in some sort of plastic. I was able to get it in long strips from my favorite industrial surplus outlet: American Science & Surplus, phone (847) 982-0870.)

The second new design, shown in Figure 2, also uses a magnetic strip over the slit. In this case, the strip in its rest position lies flat, so that the slit is normally covered. As can be seen in the end-on view, the strip is slightly wider than the portion of the tube over which it is seated. If you press one side of the strip with a finger, this raises the opposite side, creating an opening in the region opposite the pressing point. This opening functions as a tonehole. But it's an infinitely movable tonehole: you can create the opening wherever you wish along the tube, which allows for infinitely variable pitch.

This method creates a situation in which you may have the equivalent of a single tonehole appearing mid-tube. There is not a row of additional open toneholes below it, as is usually the case in conventional woodwinds. Normally, for various acoustic reasons, such a single mid-tube hole might not always speak readily, produce a well-defined pitch, or set up a strong resonance. With this particular system, however, the potential problems are somewhat alleviated by the fact that the opening is fairly long (typically an inch or more), and makes a fairly large opening.

A few more construction details:

The flexible magnetized strips — the ones I managed to get hold of, at least — display an inconvenient mix of characteristics in being slightly stretchy, yet slightly brittle, and also rather weak. As a result, they tend to go slack and/or break after they've been mounted on the instrument. You can reduce this problem by lining the upper side with some sort of reinforcement, such as duct tape. Also, notice in the design shown in figure 2 that the tension on

*The article was "Bentwood Chalumeau — a Glissando Clarinet," in *EMI* Volume IV #2 (August 1988). The bentwood chalumeau along with some related instruments were further discussed in "A Day in the Patent Library" in Volume VII #1 (June 1991). Another form of slide clarinet appears in Wes Brown's article "An Experimental Bass Slide Clarinet" in *EMI* Volume VIII #3 (March 1993).

Figure 1

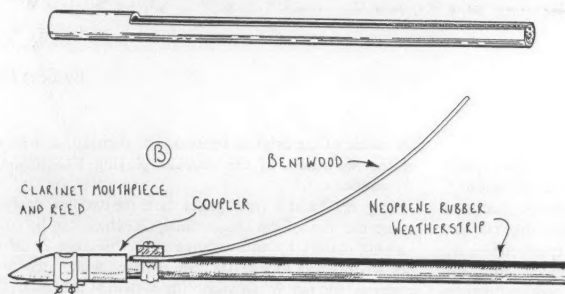


Figure 2

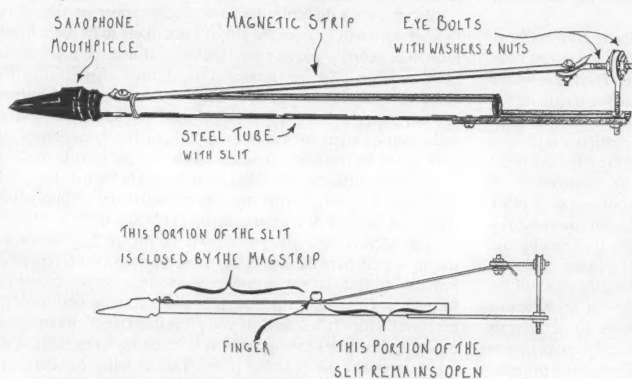


Figure 3

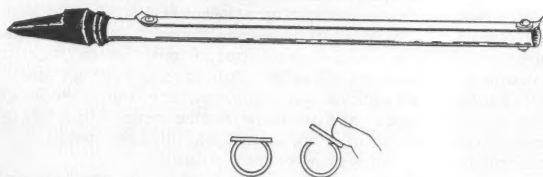


FIGURE 1, upper drawing: The tube with open slit. Lower drawing: Bentwood Chalumeau.

FIGURE 2, upper drawing: Magstrip. Lower drawing: How it works.

FIGURE 3, upper drawing: Magstrip, alternative design. Lower drawing: end-on view showing how the finger lifts one side of the strip to create an opening.

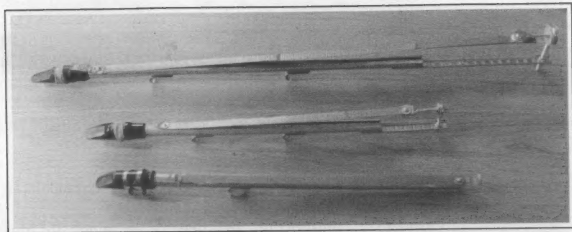
the strip is adjustable. This allows you to correct for the slow stretching of the strip that seems inevitably to occur. In spite of these efforts, it has still, in my experience, been irritatingly necessary to replace stretched or broken strips now and then.

For both designs, the edges of the slit, which form the seating for the magnetized strip, must be perfectly flat and smooth to ensure a leakless seal. It also helps if this seating is broad and flat, rather than being a pointy ridge. You can use a belt sander or other tool to sand this surface into a smooth, flat, relatively broad surface on either side of the slit. The magnetized strip sometimes collects metal dust, which interferes with the seal, so it's periodically necessary to brush the underside clean.

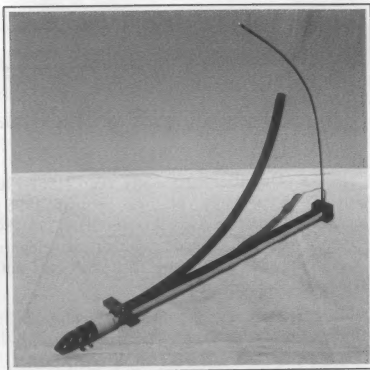
The Figure 2 design seems slightly preferable from the perspective of musical performance. The Figure 3 design is prone to inconsistency. (Pressing in given location doesn't always produce the same pitch, because it's hard to be perfectly consistent about how much you press, which causes irregularities in the size and shape of the resulting opening.)

The design in Figure 2, by the way, appears to be close to one that was patented in 1982 by Jeffrey J. Lewis, then of Los Angeles. (U.S. pat. no. 4,320,686. Drawings of his design appear in *EMI* Vol VII #1, June 1991). The Lewis design doesn't seem to have employed magnetism, and it's not clear to me how it deals with the potential problem of leakiness in the seal.

One reason for my interest in these devices is, I've spent a little time studying the question of tonehole sizing and placement in wind instruments. It is an extremely difficult business to determine in advance the tonehole placements that will yield the desired pitches for a new wind instrument design. This is especially true for reed instruments and brass, where going-on at the mouthpiece influence the resulting air column resonances in ways that vary from player to player and are difficult to foresee and calculate. Many times I've thought to myself how convenient it would be to have something like movable toneholes (a fanciful, seemingly impossible idea). That way you could get the tuning on each instrument just right, by adjusting hole positions by ear on the finished instrument. Fur-



ther, you could arrange for a single instrument to play in any tuning. I remember from my childhood a cartoon about a mad inventor who created a portable hole. It was a sort of filmy, disk-shaped thing. You could slap it on any surface, and it would become a hole in the surface. It seemed like a great idea until a bad guy got hold of it. The bad guy was going around and slapping it on the sides of banks, stepping through, peeling his hole off the inside wall and then slapping it on the side of the safe, scooping up the money, etc. I'm not a bank robber myself; I'm just trying to make a little music. The wind instrument pitch-control designs described in this article are my attempt to achieve something like a movable hole for wind instruments.



Above left: Three magstrip clarinets, the lower one being an example of the alternate magstrip design.

Above: The bentwood chalumeau.

RECENT ARTICLES, continued from back cover

"Designing and Tuning the Hammered Dulcimer" by Chris Foss: thoughts on hammer dulcimer from an experienced maker.

— plus several more articles on individual guitar makers and their techniques.

Woodwind Quarterly Issue 11, Winter 1995 (1513 Old CC Rd., Colville, WA 99114) contains a generous helping of articles on woodwind making, including —

"Aspects of Clarinet and Saxophone Mouthpiece Design: Adjustment and Repair for the Generalist Repair Technician" by William Turnidge: an overview of single reed mouthpiece elements and their acoustic functioning.

"Diagnosing Woodwind Bores, Part 2: Thinking Acoustically" by Jim Gebler: a continuation of the author's informative, readable and practical discussion of woodwind bores and their acoustic behavior.

"The Legacy of Pan" by Lew Paxton Price: Following some rather speculative history and ethnography, the

author discusses practical aspects of pan pipe making.

"Double Reed Making for Early Winds, Part" by Keith Lorraine: a detailed, extensively illustrated discussion of double reed making.



"Didgeridoo" by Scott Hirsch and others: information on didgeridoo, with a bent toward non-traditional American didgeridoo making.

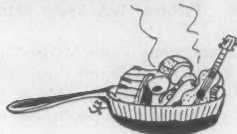
Noisegate (c/o 20 Wake Rd., Nether Edge, Sheffield, S7 1HG, England) continues to come up with article topics of potential interest to *EMI* readers in its number 2 issue, Feb 1996, including —

"Field Sensor ... Ghost Detectors" by Scott Hawkins: simple circuitry for designing a field sensor (device for recognizing the presence of electric fields), with thoughts on how such a sensor could be used in connection with interactive electronic sound-making devices for musical or artistic purposes.

"Infrasound" by Paddy Collins: Notes on the presence of subsonic vibrations in the atmosphere, their sources and their effects.

"The Simplified History of Electronic Instruments, Part 2" by Sean Reynard: This second installment has more prose than part 1 of the same article, which was primarily a listing of early electronic instruments. Also, while part 1 focused on the time period up to the second world war, part 2 emphasizes the decades following.

"Benoit Mabrey: Die Audio Gruppe: Audio Jackets, Electroacoustic Clothes" by Pia Gambardella: a description of performance groups directed by Benoit Mabrey in Berlin. Members of his "audio herd" act as living sound sculptures by wearing clothing equipped with speakers and mini-cassette players. The "audio ballerinas" wear plexiglas tutus equipped with sampling technology, allowing them to interact with and play back sounds of their immediate environment.



The following is a list of selected articles relating to musical instruments which have appeared recently in other publications.

"The U.S. Navy Steel Band: Early Years (1957-1963)" by Franz Grissom, in **Pan-Lime** Vol. 3 #2, February 1996 (c/o Panyard, Inc., 1216 California Ave., Akron, OH 44314-1842).

An account of the founding and early development of the U.S. Navy Steelband, one of the first steelbands not made up of Trinidadian nationals.

"Bumbass: Pour ne pas prendre la bumbass une lanterne" by Thierry Legros, in **Trad' Magazine** No. 43, Nov/Dec 1995 (Vecteurs, B.P. 27 - 62350 Saint Venant, France).

History of the bumbass, an early European single-string stick fiddle with a resonator made from an inflated bladder. (In French.)

"Precision Woodwind Key Fitting and Padding" by Tom Wheeler, in **TechniCom** Vol. 21 #1, Jan/Feb 1996 (Box 51, Normal, IL 61761)

Instructions on key work for woodwinds.

"Infection Control in the Music Environment" by Patricia L. Day, also in **TechniCom** Vol. 21 #1, Jan/Feb 1996 (address above).

Notes on how to sterilize mouthpieces and prevent transmission of infections when wind instruments are shared among players.

"What Makes a Guitar a Guitar?" by George Gruhn, in **The Music Trades**, February 1996 (PO Box 432, Englewood, NJ 07631).

An overview of the great variety of forms that guitars have taken over the years.

"Carillons: Making Heavy-Metal Music with Staying Power" in **Smithsonian** 25/8, November, 1994.

A generously illustrated article on bell towers, bell ringing and bell making.

"From Sciarino to Subharmonics" by Robert Neuwirth, in **Strings** #44, Sept/Oct 1994.

Concerning the work of Mari Kimura, who in addition to perfecting a technique of performing undertones, allowing her to play notes an octave lower than the violin's low G, performs interactive works on electric violin with computer.

"Apprendre le Tabla" by Marc Olavari, in **Percussions** No. 43, Jan/Feb 1996 (18, rue Theodore-Rousseau, F-77930 Chailly-en-Bierre, France).

History and organologie of the tabla, with glossary, bibliography and discography (in French).

"La Txalaparta" by Josu Goiri, also in **Percussions** No. 43 (address above).

Txalaparta is an instrument of the Basque country of France, consisting of a table-like arrangement of long percussion bars on a stand.

"Le 'Dernier' Xylophone" by Fabrice & Nathalie Marandola, in **Percussions** No. 42, Nov/ Dec 1995 (address above).

Organology, construction and playing technique for this lap-held, gourd-resonated xylophone of Cameroon.

"Perverting Technological Correctness" (no author credited), in **Leonardo** Volume 28 #4, 1995 (MIT Press Journals, 55 Hayward St., Cambridge, MA 02142-9902, USA).

Among several artists touched upon in this essay is Trimpin, maker of computer-controlled, electro-mechanically activated acoustic sound environments. His installation *Phffft* is discussed, with a photo.

Leonardo Music Journal Volume 5, 1995 (address same as *Leonardo* above) contains several articles of note:

"An Unheard of Organology", by Douglas Kahn, posits an organology for conceptual musical instruments — that is, sound sources imagined but never actually heard.

"Chromatic Notation of Music: Transforming Bach and Webern into Color and Light," by Brigitte Burgmer, proposes a set of color-correspondences for musical pitches, and application of this system to pieces in the European classical repertoire. In this manner she created a set of drawings representing pre-existing musical compositions, and later generated holograms based on the drawings.

"Acoustic and Virtual Space as a Dynamic Element of Music," by Pauline Oliveros, discusses (among other things) the author's development of the Expanded Instrument System aided by the composer and technician Panaiotis. The system is designed for real-time control of electronic effects during Oliveros' accordion performances, with an eye toward for fluid transition between different perceived acoustic listening spaces.

Koukin Journal No. 8, Dec 1994 (1-12-25 Midorigaoka, Ageo, Saitama 362, Japan) contains articles on a wide range of jaw harp types, particularly Pacific, Asian and Siberian.

The Soundscape Newsletter No. 12 (School of Communication, Simon Fraser University, Burnaby, BC, Canada, V5A 1S6), in this its last issue, contains communications regarding environmental sound and soundwork from people scattered around the world.

FoMRHI Quarterly No. 82, Jan. 1996 (171 Iffley Rd., Oxford OX4 1EL, U.K.) contains, among many other things, several articles on gut strings, reviews of new books on instruments, and other items related to early instruments and their construction.

Several articles of note appear in **American Lutherie** #43, Fall 1995 (8222 South Park Ave., Tacoma, WA 98408-5226) including —

"Developing Models for Contemporary Violin Making" by Guy Rabut: a discussion of his approaches to altering violin form and decorative elements toward a more contemporary style, while retaining the essential acoustic components and playing-feel of the traditional violin.